FURUNO

Installation Manual
NAVIGATIONAL ECHO SOUNDER
FE-700

FURUNO ELECTRIC CO., LTD.

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SAFETY INSTRUCTIONS

WARNING

ELECTRICAL SHOCK HAZARD
Do not open the equipment unless totally familiar with electrical circuits and service manual.

Only qualified personnel should work inside the equipment.

Turn off the power at the switchboard before beginning the installation.

Fire or electrical shock can result if the power is left on.

Do not install the equipment where it may get wet from rain or water splash.

Water in the equipment can result in fire, electrical shock or equipment damage.

Be sure no water leaks in at the transducer mounting location.

Water leakage can sink the vessel. Also confirm that the transducer will not loosen by ship's vibration. The installer of the equipment is solely responsible for the proper installation of the equipment. FURUNO will assume no responsibility for any damage associated with improper installation.

Be sure that the power supply is compatible with the voltage rating of the equipment.

Connection of an incorrect power supply can cause fire or equipment damage. The voltage rating of the equipment appears on the label above the power connector.

CAUTION

Observe the following compass safe distances to prevent deviation of a magnetic compass:

	Standard compass	Steering compass
Display unit	0.50 m	0.40 m
Distribution Box	1.90 m	1.15 m
Matching Box	0.50 m	0.40 m
Transducer Switch Box (option)	1.00 m	0.60 m
Junction Box (option)	0.30 m	0.30 m
Digital depth indicator (option)	0.50 m	0.40 m
Distribution box (option)	0.30 m	0.30 m

When handling the transducer cable, keep in mind following points.

- Keep the cable away from oil and fuel.
- Keep the cable away from the place where it may be damaged during the installation.
- Do not paint the cable.

The sheath of the transducer cable is made of chlorophrene rubber (or vinyl chloride). Therefore, do not paint the sheath with organic liquid (such as toluene) since it may harm the sheath.

EQUIPMENT LISTS

Standard Supply

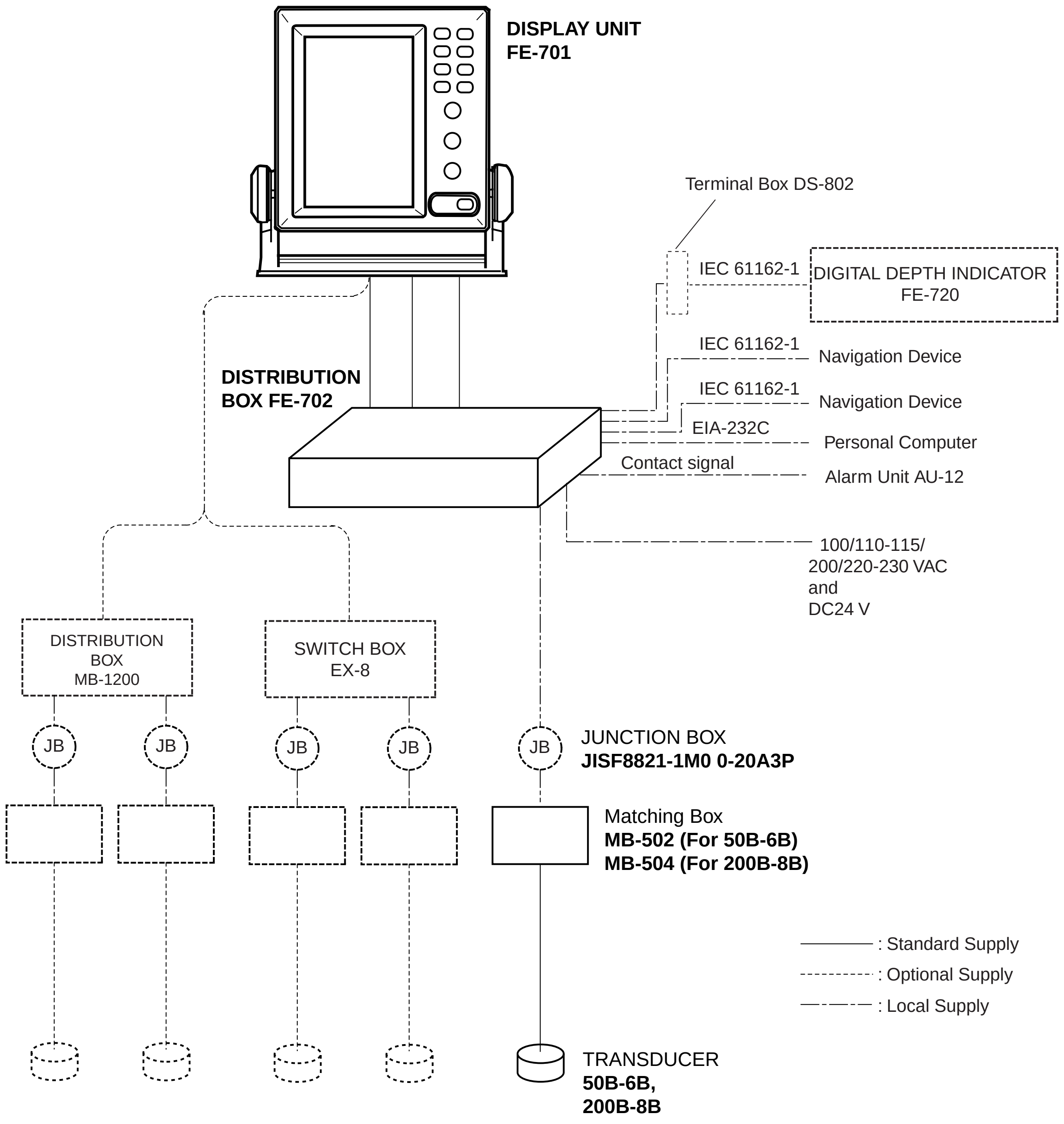
Name	Type	Code no.	Qty	Remarks
Display Unit	FE-701	-	1	w/Installation Materials CP02-06400 (000-015-872) and Accessories FP02-04800 (000-015-469)
Distribution Box	FE-702	-	1	
Matching Box	MB-502	000-013-602	1	For 50B-6B
	MB-504	000-013-604		For 200B-8B
Transducer	50B-6B	-	1	w/15 m or 30 m cable
	200B-8B	-		w/15 m, 30 m or 50 m cable
Transducer Tank	TTF-5600	000-015-586	1	For 50B-6B
	TTF-2000	000-015-587		For 200B-8B
Spare Parts	SP02-04101	001-228-890	1 set	For distribution box
Installation Materials	CP02-06301	001-228-950	1 set	For distribution box

Optional Supply

Name	Type	Code no.	Qty	Remarks
Transducer Switch Box	EX-8	000-012-179	1	Flush mount, color specified
		000-012-176		Bulkhead mount, color specified
		000-012-183		7.5BG7/2, Flush mount
		000-012-182		7.5BG7/2, Bulkhead mount
		000-012-180		N.G, Flush mount
		000-012-181		N.G, Bulkhead mount
Cable Assy.	FM-C6FPS003-020	000-143-821	1	2 m cable w/ a 6P connector For EX-8
JUNCTION Box	JIS F8821-1MO 0-20A3P	000-804-877	1	
Transducer Tank	TTF-5001	000-015-877	1	For 50B-6B
	TTF-2001	000-015-878		For 200B-8B
	TTF-5002	000-015-885		For 50B-6B (w/Flange)
	TTF-2002	000-015-887		For 200B-8B (w/Flange)
Bulkhead Kit	OP02-78-1	001-229-270	1	2.5GY5/1.5
	OP02-78-2	001-229-280		7.5BG7/2
Flush Mount Kit (F)	OP02-79-1	001-229-290	1	N3.0
	OP02-79-2	001-229-300		2.5GY5/1.5
	OP02-79-3	001-229-310		7.5BG7/2
Flush Mount Kit (S)	OP02-80	001-229-320	1	
Data Recording Software for PC	02-522-990	001-229-090	1	For Windows 95/98/NT4.0
Digital Depth Indicator	FE-720	000-029-025	1 set	w/Installation Materials CP02-06700 (000-029-068) Spare Parts SP65-00601 (002-889-730) Accessories FP65-00400 (000-029-067)

Name	Type	Code no.	Qty	Remarks
Dimmer	MF-22L-1-100V	000-069-401	1	100 VAC-120 VAC, Flush mount type
	MF-22L-1-200V	000-069-403		200 VAC-240 VAC, Flush mount type
	MF-22L-2-100V	000-069-402		100 VAC-120 VAC, Bulk head type
	MF-22L-2-200V	000-069-404		200 VAC-240 VAC, Bulk head type
Terminal Box	DS-802	000-029-064	1 set	With Installation Materials CP65-00903 (000-029-064)
EGC Printer	PP-505-FE	000-055-892	1 set	
Gate Valve	GV-50B-6B	000-015-265	1	With Installation Materials CP02-07601 (002-891-620)
	GV-200B-8B	000-015-273		
Alarm Unit	AU-12	-	1	
Distribution Box	MB-1200	000-016-185	1 set	For connection of transducer 50B-6B, 200B-8B, instructions included.

SYSTEM CONFIGURATION



1. MOUNTING

NOTICE

Do not apply paint, anti-corrosive sealant or contact spray to coating or plastic parts of the equipment.

Those items contain organic solvents that can damage coating and plastic parts, especially plastic connectors.

1.1 Category of Equipment

Equipment for protected area

- Display Unit
- Distribution Box
- Matching Box
- Transducer Switch Box (option)
- Digital Depth Indicator (option)

Equipment to be submerged

- Transducer

1.2 Display Unit

1.2.1 Mounting consideration

The display unit can be installed on a tabletop, on the overhead, on the bulkhead or flush mounted in a console or panel.

When selecting a mounting location for the display unit keep the following in mind.

- Keep the display unit out of direct sunlight.
- The temperature and humidity should be moderate and stable.
- Locate the unit away from exhaust pipes and vents.
- The mounting location should be well ventilated.

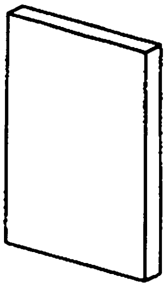
• Mount the unit where shock and vibration are minimal.

• Keep the unit away from electromagnetic field-generating equipment such as motors and generators.

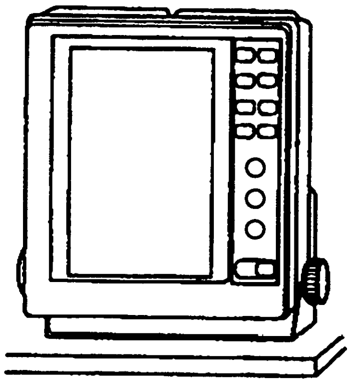
• For maintenance and checking purposes, leave sufficient space at the sides and rear of the unit and leave slack in cables.

• A magnetic compass will be affected if placed too close to the display unit. Observe the following compass safe distances to prevent disturbance to the magnetic compass.

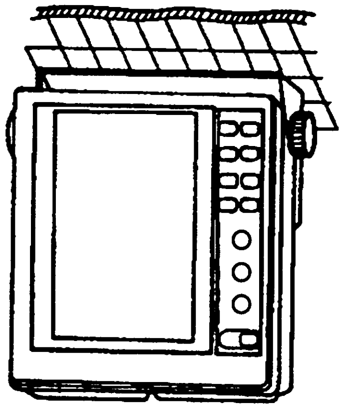
Standard compass: 0.50 meters
Steering compass: 0.40 meters



Cover



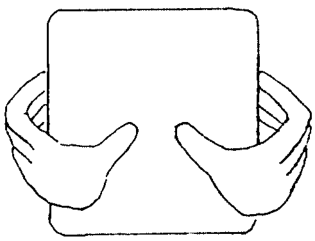
Desktop



Overhead

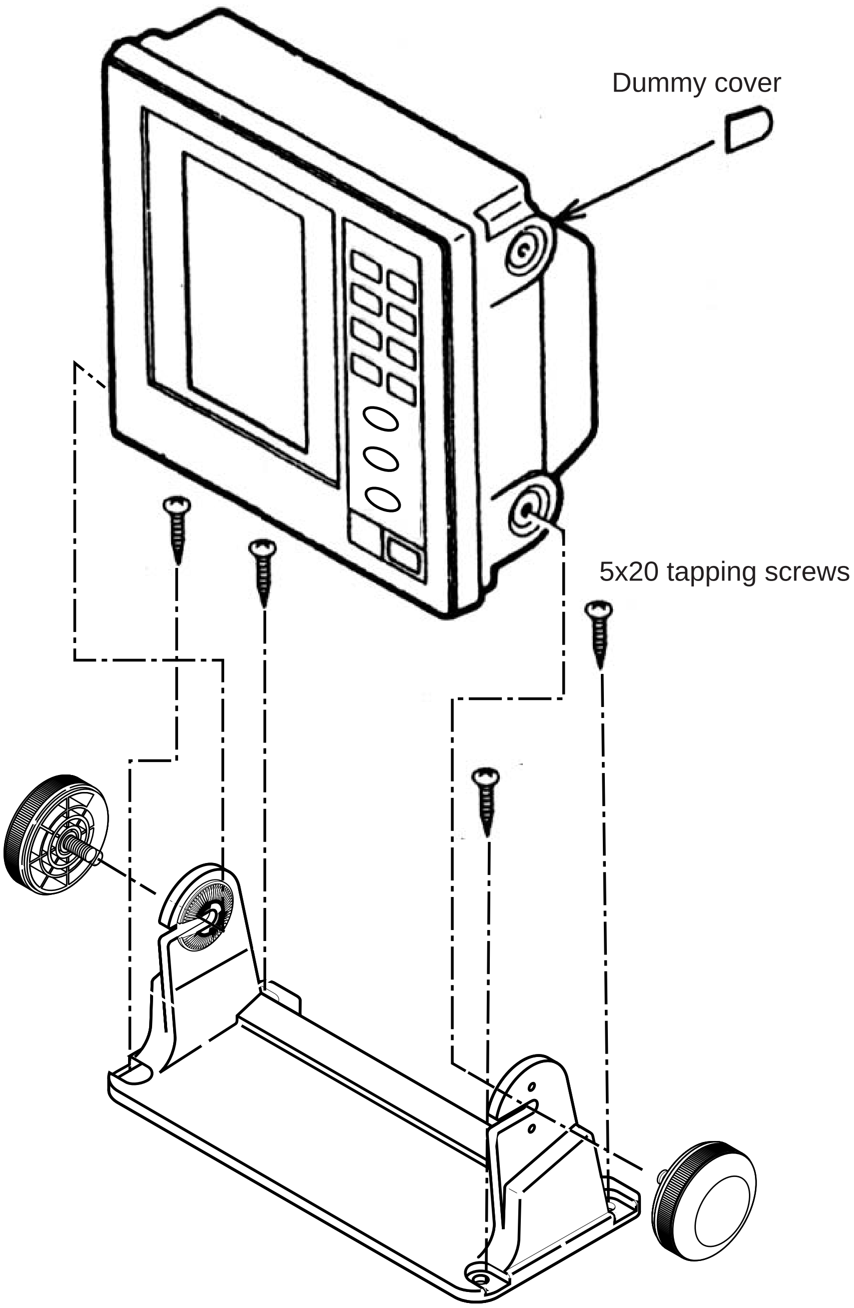
1.2.2 Removing the cover

While pressing the center of the cover with your thumbs as illustrated, pull the cover towards you to remove it.



1.2.3 Desktop mounting

1. Fix the hanger with four tapping screws (5x20).
2. Screw knob bolts in display unit, set it to hanger, and tighten knob bolts.
3. Attach the dummy covers to the unused holes.



1.2.4 Flush mounting

There are two types of flush mount kits, F type and S type. For details, see the outline diagrams at the back of this manual.

F type

Flush Mount Kit (F): OP02-79-1 (001-229-290)
OP02-79-2 (001-229-300)
OP02-79-3 (001-229-310)

No.	Name	Type	Code no.	Qty	Remarks
1	Cosmetic panel	02-129-1041-0	100-279-270	1	OP02-79-1:N3.0
			100-279-280		OP02-79-2:2.5GY5/1.5
			100-279-290		OP02-79-3:7.5GY7/2
2	Hex bolt	M6x12	000-162-897-10	4	
3	Spring washer	M6	000-158-855-10	4	

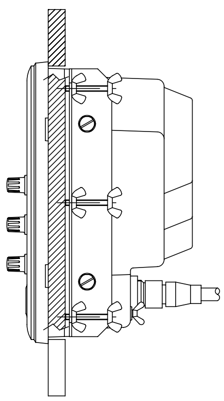
1. Prepare a cutout in the mounting location whose dimensions are 210 (W) x 194 (H) mm.
2. Attach the cosmetic panel (02-129-1041-0) to the display unit with four hex bolts (M6x12) and four spring washers (M6).
3. Fix the display unit to the mounting location with four tapping screws (5x20).

S type

Flush Mount Kit (S): OP02-80 (001-229-320)

No.	Name	Type	Code no.	Qty	Remarks
1	Fixing plate	02-129-1045-0	100-279-300	2	
2	Wing bolt	M4x30	000-804-799	6	
3	Hex bolt	M6x12	000-162-897-10	4	
4	Spring washer	M6	000-158-855-10	4	
5	Wing nut	M4	000-863-306	6	

1. Prepare a cutout in the mounting location whose dimensions are 194 x 194 mm.
2. Insert the display unit to the cutout.
3. Attach two fixing plates (02-129-1045-0) to the display unit with four hex bolts (M6x12) and spring four washers (M6).
4. Screw six wing bolts (M4x30) to wing nuts (M4).
5. Fasten the display unit with six wing bolts and nuts.



1.3 Transducer

The installation of the transducer and the tank should be accomplished by a dockyard referring to the installation drawings at the back of this manual. An example of transducer installation method is also shown in paragraph 1.3.2.

Note: Discussions should take place and agreement reached with the dockyard for sufficient reinforcement and watertightness of the hull to comply with the regulations concerned.

1.3.1 Mounting Location

To decide the location of the transducer, the following points should be taken into account.

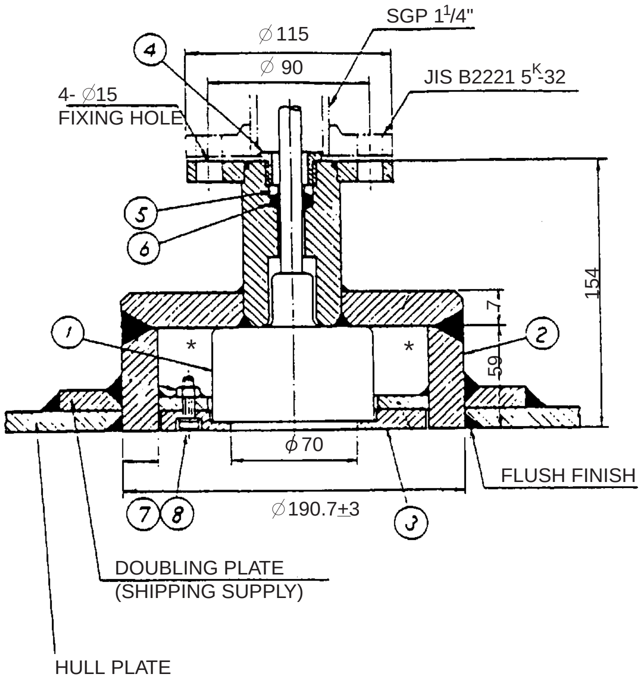
- The most important matter is where the transducer is installed. The position should be free from aeration possibly occurring beneath the hull and also not affected by engine and propeller noise.
- It is known that air bubble streams start approximately from a quarter length from the bow, and spreads over the hull bottom approximately to three quarters. Air bubble streams vary in form and intensity according to ship's speed, draught, trim, shape of bow and hull, as well as sea state.
- In a laden ship, a position somewhere near a quarter of the ship's length from the stern often gives satisfactory results. As for vessels such as oil tankers whose fore draught is especially shallow, an after position about three quarters of ship's length from the stern is often suitable.
- It is recommended to install the transducer on the keel line or between 600 mm and 900 mm from the keel to minimize the effect of aerated water.
- Sitting near obstructions such as the forward propeller, bow thruster, water intake pipes and speed log sensor should be avoided.
- Select a place giving minimum mechanical vibration.
- Do not lay the transducer cable near or in parallel with other electric cables.

1.3.2 Example of Transducer Installation (TTF-5600)

Note: Never fail to remove the transducer and rubber gasket prior to welding the transducer tank to the hull.

1. Install the transducer tank on the hull. The tank bottom should be flush with the hull bottom. Feed the transducer cable through the cable gland.
2. Apply sealing tape to the threads of the gland nut for watertightness.
3. Pass the cable thru the gasket, washer and gland nut.
4. Fix the transducer to the tank with the transducer fixing flange.
5. Coat the gland nut with silicone grease.
6. Tighten the gland nut.

7. It is recommended to enclose the transducer cable in a conduit pipe for waterproofness and electrical shielding as well as for protecting the cable from mechanical damage. The conduit pipe should be fixed to the flange on the transducer tank. The pipe should be of such a length to clear the water level when the ship is fully loaded. The pipe end should be finished with filling compound. It is recommended to fill the pipe with sand between the transducer and the junction box (or matching box). This will protect the transducer from vibration and damage.



1	Transducer (50B-6B)
2	Transducer Tank
3	Fixing Flange
4	Gland Nut
5	Washer
6	Rubber Gasket
7	Hex. Bolt (M6x25)
8	Spring Washer (For M6)

Sea water comes into the area marked with "" inside the tank.

Transducer Tank for 50B-6B Transducer

1.4 Distribution Box

A magnetic compass will be affected if placed too close to the distribution box. Observe the following compass safe distance to prevent disturbance to the magnetic compass.

Standard compass: 1.90 meters

Steering compass: 1.15 meters

Fasten the distribution box with four tapping screws (6x30) referring to the outline drawing at the end of this manual.

1.5 Matching Box

The matching box should be selected depending on the transducer type;

• 50B-6B transducer: MB-502

• 200B-8B transducer: MB-504

Fasten the matching box with four Trapping screws (6x20: local supply). Compass safe distances are as follows; standard compass: 0.50 m, Steering compass: 0.40 m.

1.6 Digital Depth Indicator FE-720 (option)

The indicator can be installed on a tabletop, on the overhead. Refer to outline drawings at the end of this manual for installation instructions. When selecting a mounting location, keep in mind the following points:

• Locate the unit away from exhaust pipes and vents.

• The mounting location should be well ventilated.

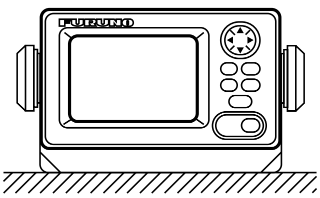
• Mount the unit where shock and vibration are minimal.

• Locate the unit away from equipment which generates electromagnetic fields such as a motor or generator.

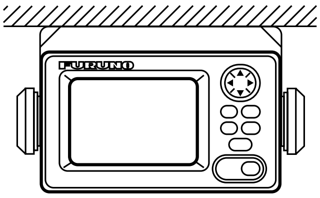
• Allow sufficient maintenance space at the sides and rear of the unit and leave sufficient slack in cables, to facilitate maintenance and servicing.

• Observe the following compass safe distances to prevent deviation of a magnetic compass. Standard compass: 0.50 m, Steering compass: 0.40 m.

1. Fasten the hanger with four self-tapping screws (5x20).
2. Fasten the digital depth indicator to the hanger with two knobs.



Tabletop



Overhead

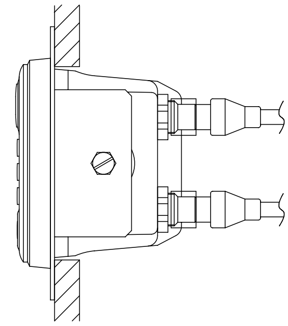
■ Flush mounting

There are two types of flush mount kits, F type and S type. For details, see the outline diagrams at the back of this manual.

F type

Use the accessories FP65-00401 (See page A-7).

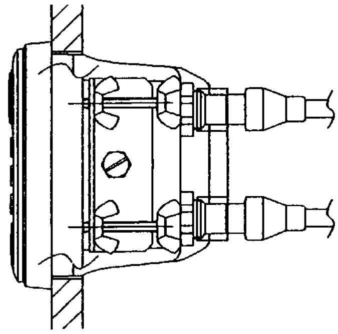
1. Prepare a cutout in the mounting location whose dimensions are 183 (W) x 92 (H) mm.
2. Attach the cosmetic panel (20-016-1051) to the indicator with two hex bolts (M6x12) and two spring washers (M6).
3. Fix the indicator to the mounting location with four tapping screws (5x20).



S type

Use the accessories FP65-00402 (See page A-8).

1. Prepare a cutout in the mounting location whose dimensions are 167 (w) x 92 (H) mm.
2. Insert the indicator to the cutout.
3. Attach two fixing plates (20-007-2401) to the indicator with two hex bolts (M6x12) and two spring washers (M6).
4. Screw four wing bolts (M4x30) to wing nuts (M4).
5. Fasten the indicator with four wing bolts and nuts.



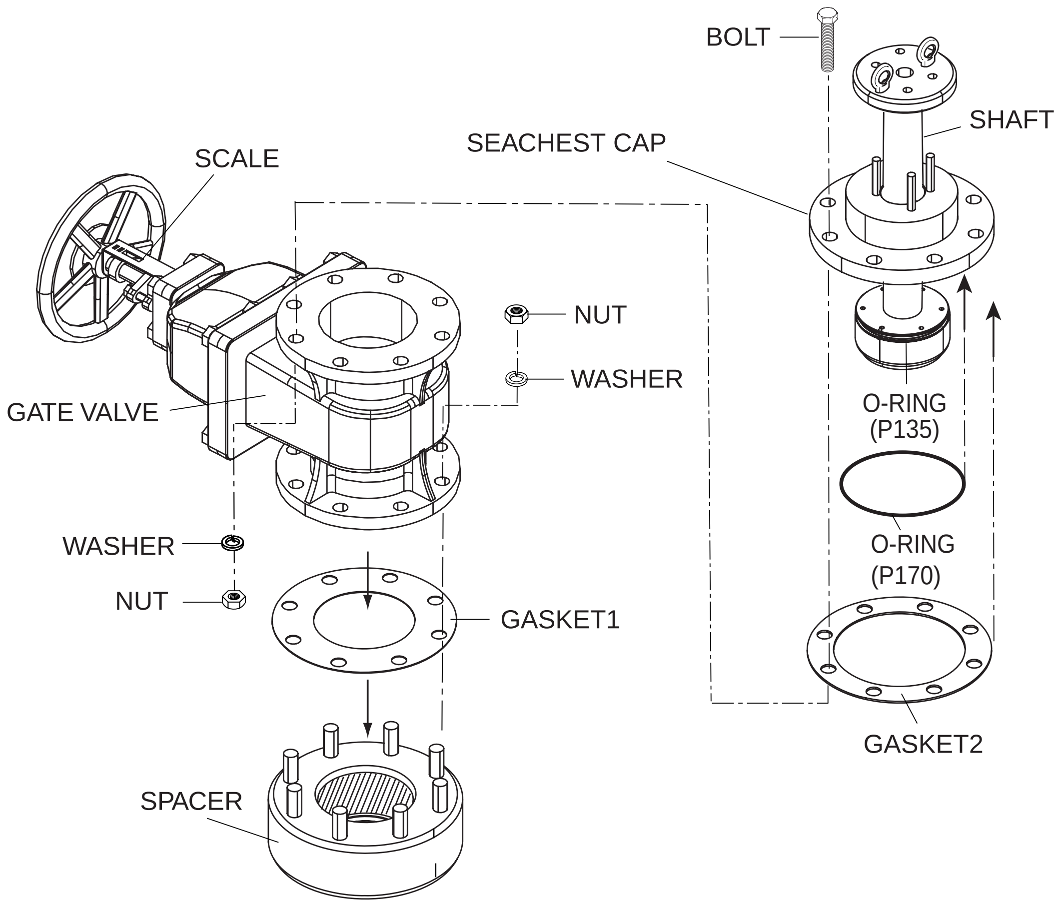
1.7 Transducer Switch Box EX-8 (option)

If two transducers are installed, the transducers switch box is required. Locate the transducer switch box near the display unit considering length of the interconnection cable. Select the bright place where the panel of equipment can be watched. Use only the screws supplied on the terminal inside to make connections. Use of other screws may cause a short circuit. Compass safe distances are as follows; standard compass: 1.00 m, Steering compass: 0.60 m.

1.8 Gate Valve GV-50B-6B, GV-200B-8B (option)

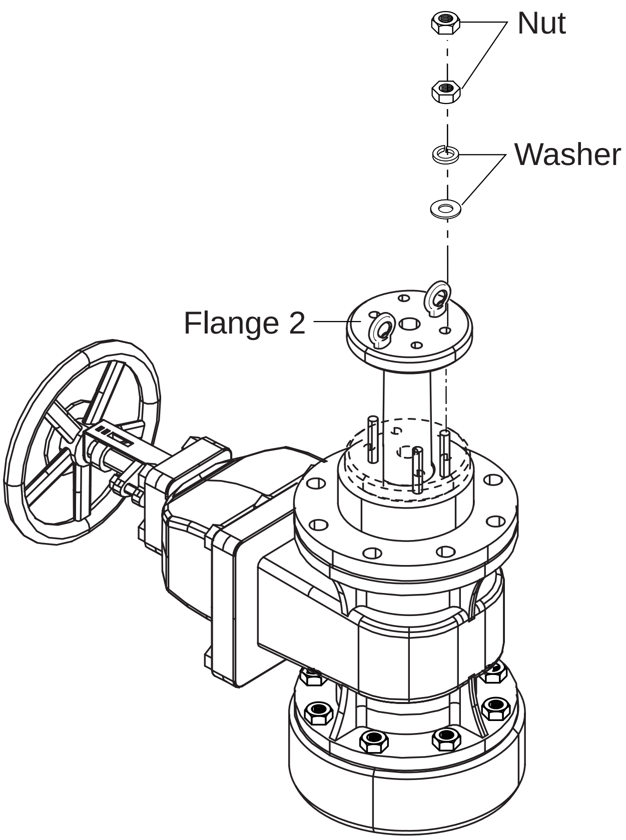
Assemble the Gate Valve as shown below. Refer to the drawing at the end of this manual.

1. Disassemble the gate valve assembled tentatively: spacer, gasket1, gate valve, gasket 2, O-ring (P170), seachest cap and shaft assembly.
   When assembling the gate valve, use original washers, bolts and nuts. Keep the bottom of the seachest cap and the shaft free of dust and be careful not to damage them.



2. Weld the spacer to the hull bottom.
   The hull side of the spacer should be flush with the hull bottom. Be careful not to damage the side fixed to the gate valve.
3. Clean the side of the spacer to be fixed to the gate valve.

4. Grease (supplied) both sides of the gasket 1 and the inner side of the spacer. Place the gasket 1 onto the spacer.
5. Clean the flange side of the gate valve, and place it on the gasket 1. The scale side of the gate valve should be up.
6. Fix stud bolts with washers and bolts loosely.
7. Keep seachest cap and shaft assembly free of dirt and dust.
8. Grease O-ring (P170) and seachest cap lightly, and attach O-ring (P170) and gasket 2 to the bottom of seachest cap.
   O-ring (P170) and gasket 2 are attached by adhesion of grease.
9. Place the assembly made at step 8 on the gate valve.
10. Fix the assembly with bolts, nuts and washers loosely.
11. Unscrew nuts from flange 2, and confirm that shaft can be moved up and down smoothly by hand.
    You will feel some resistance because of the O-ring (P135). (See the illustration on the previous page.)

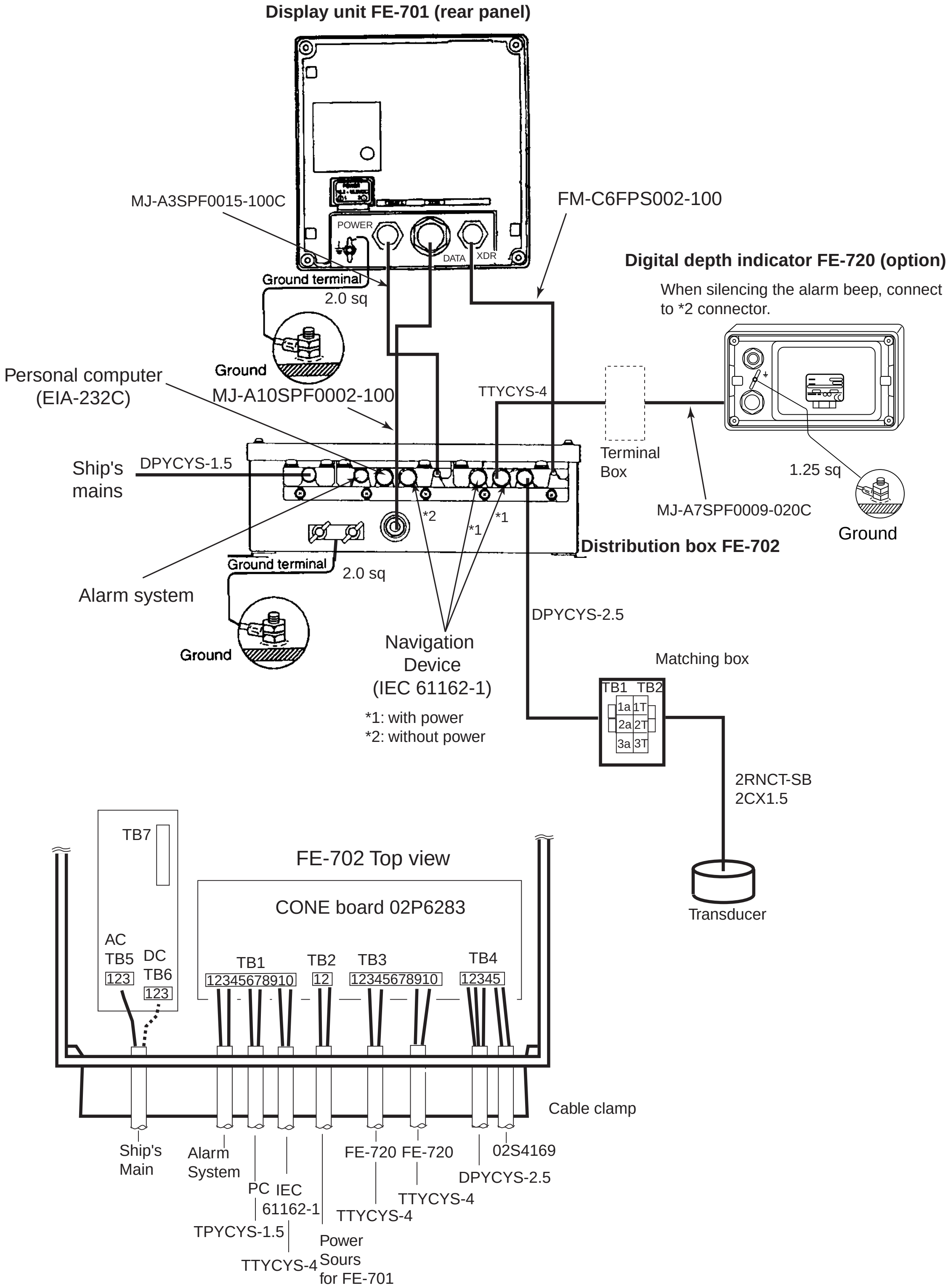


12. Fasten the gate valve with bolts, nuts and washers above and below.

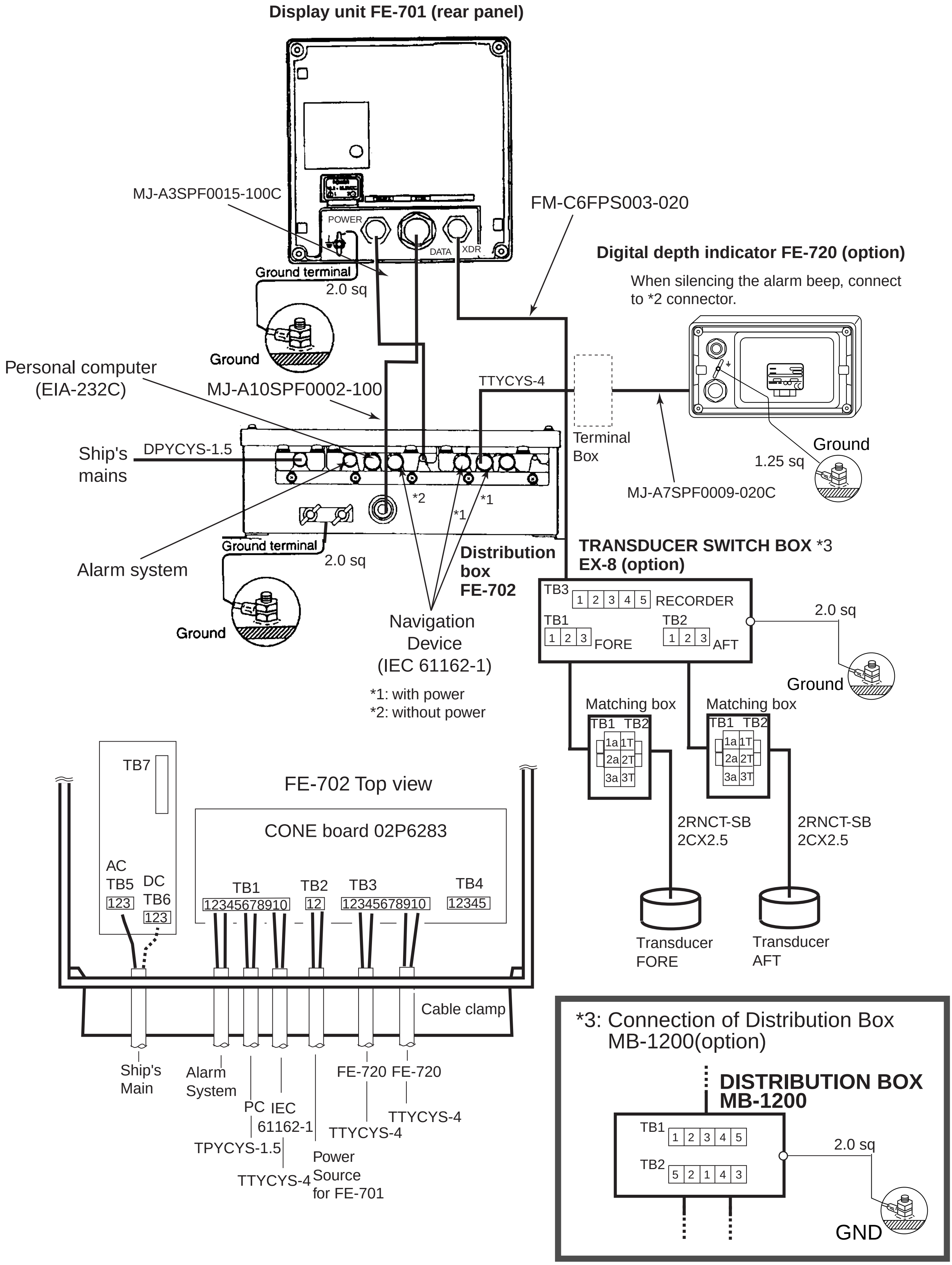
NOTE) When installing a transducer, do it before step 7 or after removing the seachest cap and the shaft assembly.

Wiring

Connect three cable assemblies (supplied) between the display unit and distribution box. See the interconnection diagram for details.

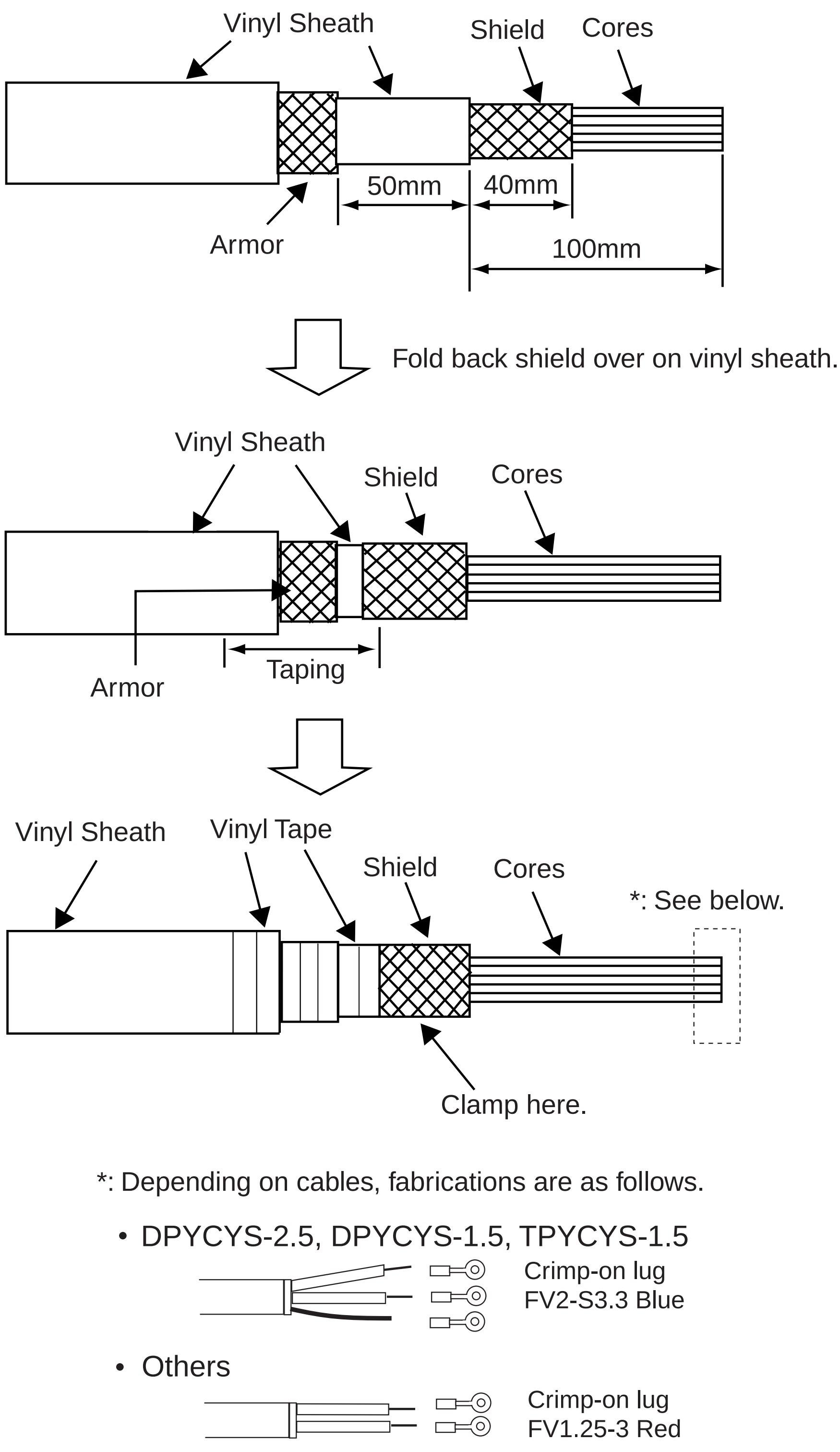


When the Transducer Switch Box EX-8 or Distribution Box MB-1200 is used, the interconnections are as follows.



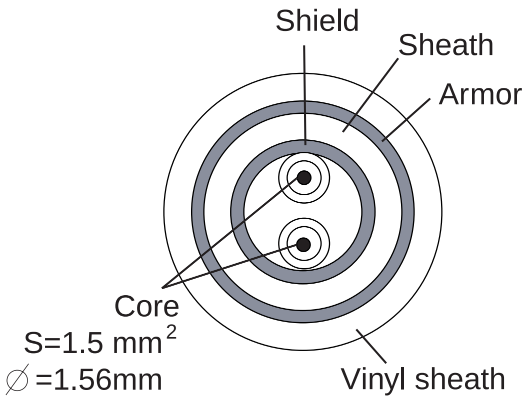
Cable Fabrication of DPYCYS-2.5, DPYCYS-1.5, MJ-A3SPF0015-100C , FM-C6FPS0002-100 and TPYCYS-1.5

Fabricate the power and other cables as illustrated below to connect them to the Distribution box.

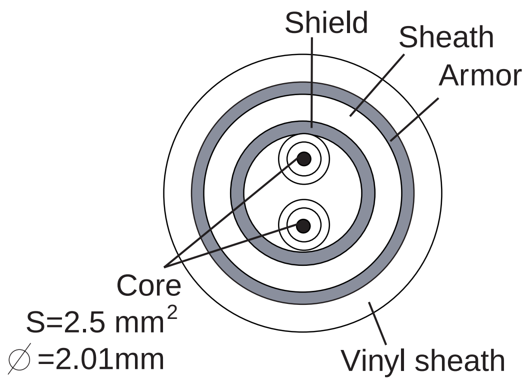


Fabrication of cables

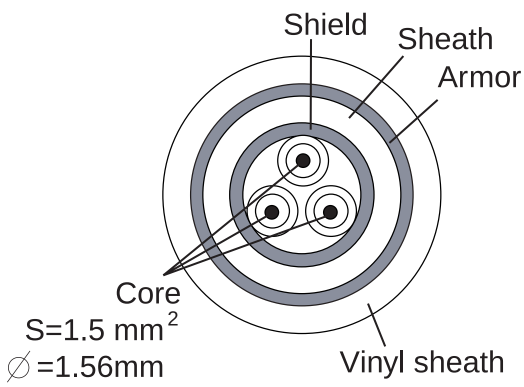
Several cables are required to supply at local. In this manual, JIS (Japan Industrial Standard) cables are specified. Use equipment cables refering to the figures below.



DPYCYS-1.5 sectional view



DPYCYS-2.5 sectional view

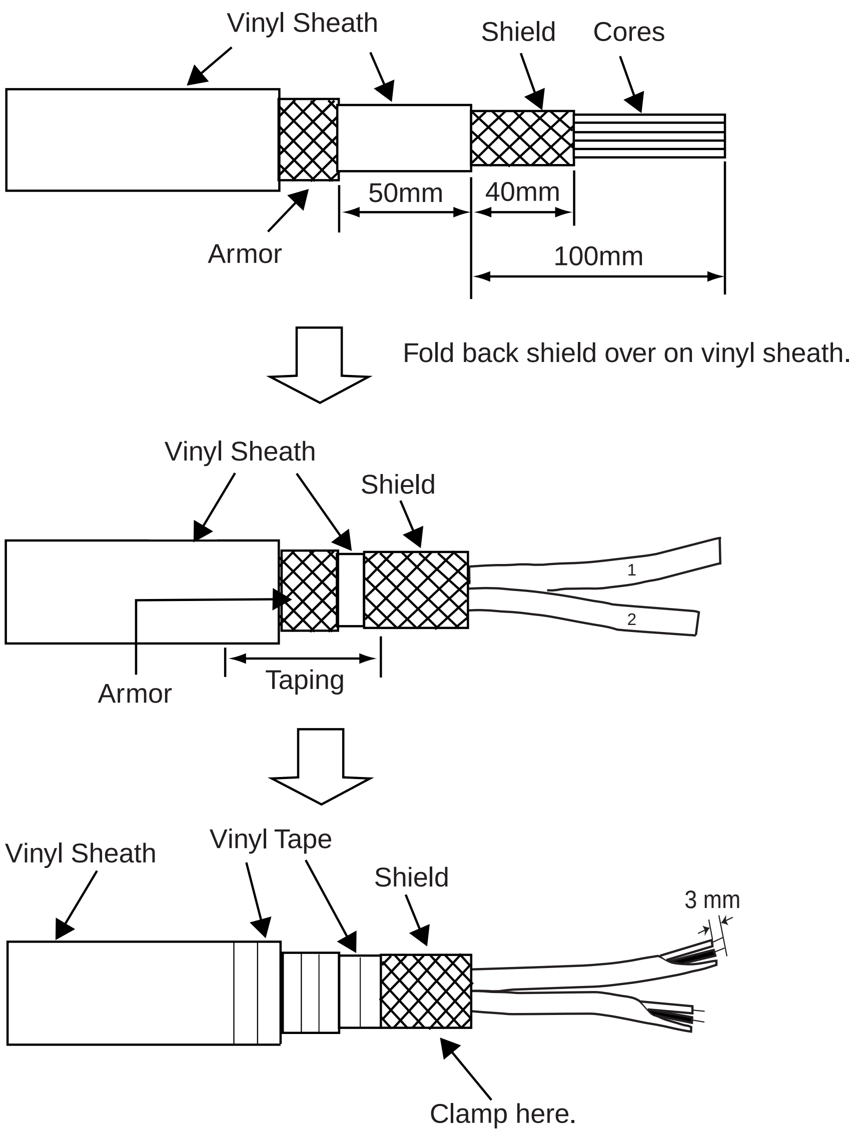


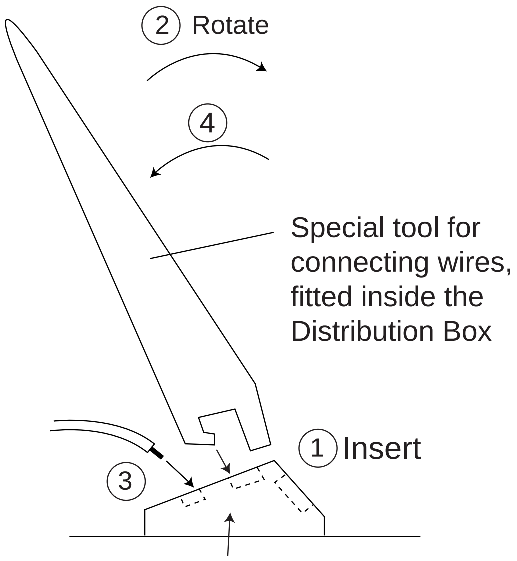
TPYCYS-1.5 sectional view

JIS Cables (Cross section)

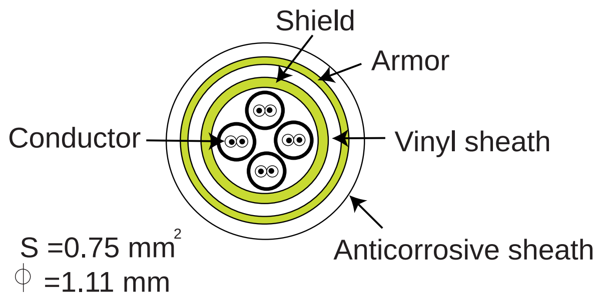
Cable Fabrication of TTYCYS-4

TTYCYS is a Japan Industrial Standard (JIS) cable. Use the equipment one.





Terminal Board TB1, TB3 Cross section



(Sectional view)

Fabrication of cable TTYCYS-4

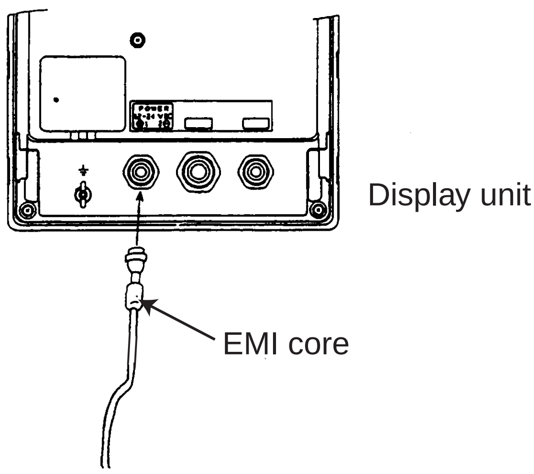
Power Supply Cable from Ship's Mains

If the ship's mains is AC, the power supply cable must be connected to TB5 in the Distribution Box. In case of DC ship's mains, cable must be connected to TB6 in the Distribution Box. For further information, refer to page 16.

Attaching EMI core

Attach EMI core (supplied) to the power cable to prevent noise.

13. Tape the power cable where the EMI core is to be attached, to hold the core in place.
14. Fasten the core close to the power cable connector.



Transducer

Connect the transducer cable to the distribution box. If necessary, attach the junction box between the distribution box and matching box.

Ground

Connect the ground wire (2.0 sq.) from both the display unit and distribution box to ship's ground to prevent interference to the picture. Shorten the ground wire as much as possible.

The optional digital depth indicator FE-720 should be grounded by 1.25 sq. wire.

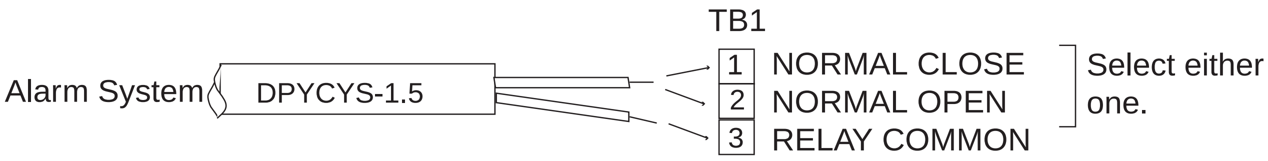
Note 1: Ground the equipment to prevent mutual interference.

Note 2: Use "closed-type" lugs (supplied) to make the ground connection at the display unit and distribution box. Do not use an "open-type" lugs.

Alarm system connection

The power error and shallow water alarms, which produce audio and visual alarms in the event of power failure and shallow water, can be output by connecting the distribution box to the ship's alarm system.

Connect the DPYCYS-1.5 cable between TB1 in the Distribution Box and the alarm system of the ship referring to the schematic diagram at the end of this manual.

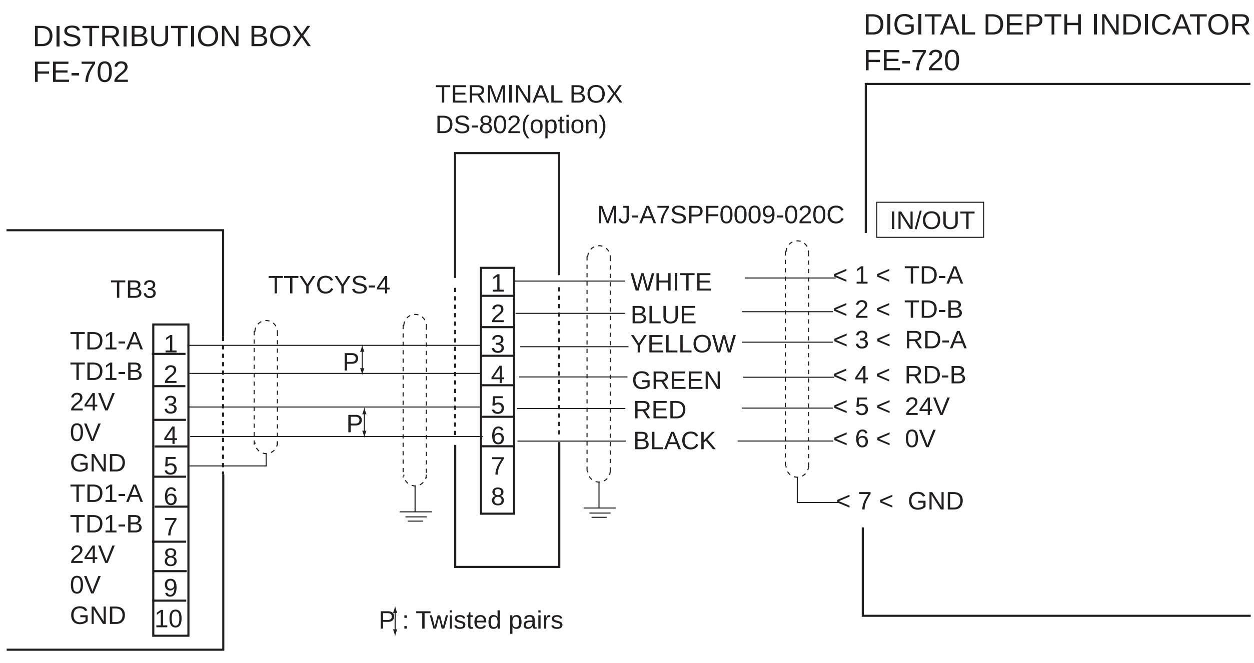


Digital Depth Indicator FE-720

There are two methods to connect the digital depth Indicator FE-720.

Case 1: Input signal from the main display unit to FE-720

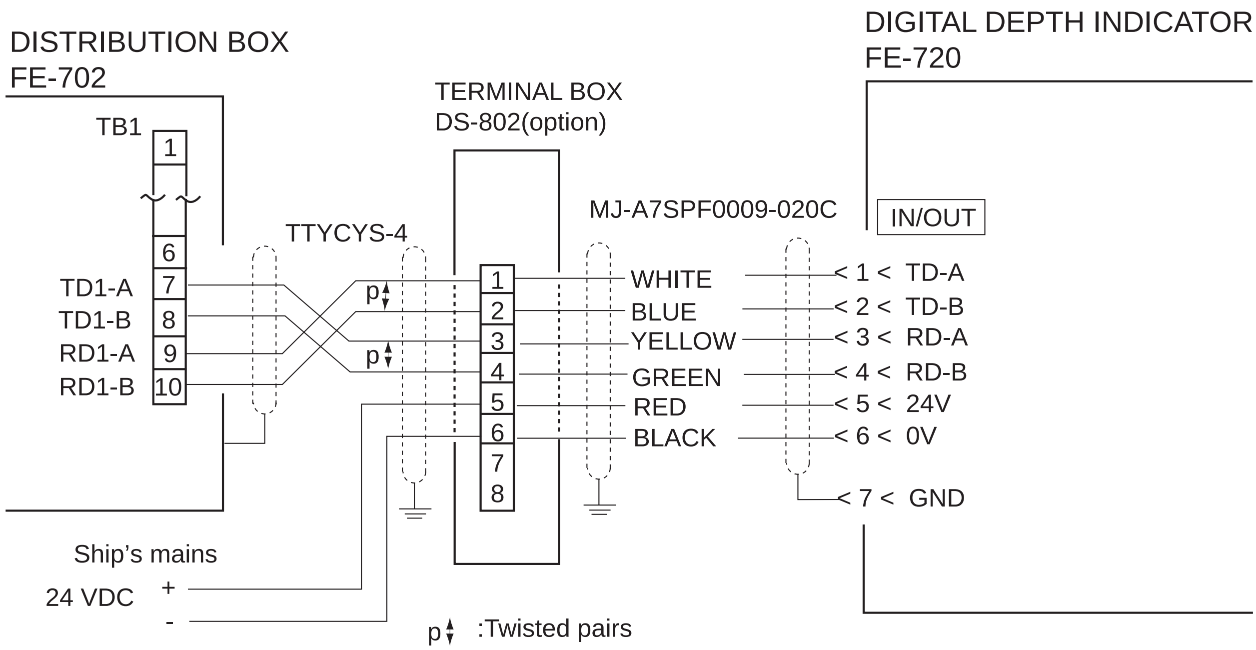
The interconnection is as follows.



Case2: Silencing the alarm from the digital depth indicator FE-720

When the main display unit FE-701 activates an alarm, it can be deactivated at the FE-701 itself and also, it can be deactivated from the digital depth indicator FE-720. To do this, connect as follows.

Connection



Note: In this case, a positioning device can not be connected.

FE-720 setting

In the menu of the FE-720, ALARM should be set to ON. If an alarm activates, press any key on the FE-720, then the alarm will be deactivated at the FE-701 and FE-720.

MENU	
DIM CONTROL	
	PANEL ONLY
ゲンゴ/LANG.	ENGLISH
UNITS	
ALARM SET	ON
TEST	

3. CHANGING POWER SPECIFICATIONS

This unit is set at factory to operate from 220-230 VAC ship's mains. For connection to a 100 VAC, 110-115 VAC, 200 VAC or 24 VDC ship's mains, modify the connections in the distribution box as shown below.

Note: Tick the appropriate box on the inside of the FE-702 distribution box cover to denote the power use.

☐ 200-230 VAC (50/60 Hz)
☐ 100-115 VAC (50/60 Hz)
☐ 24 VDC

Label inside the distribution box FE-702

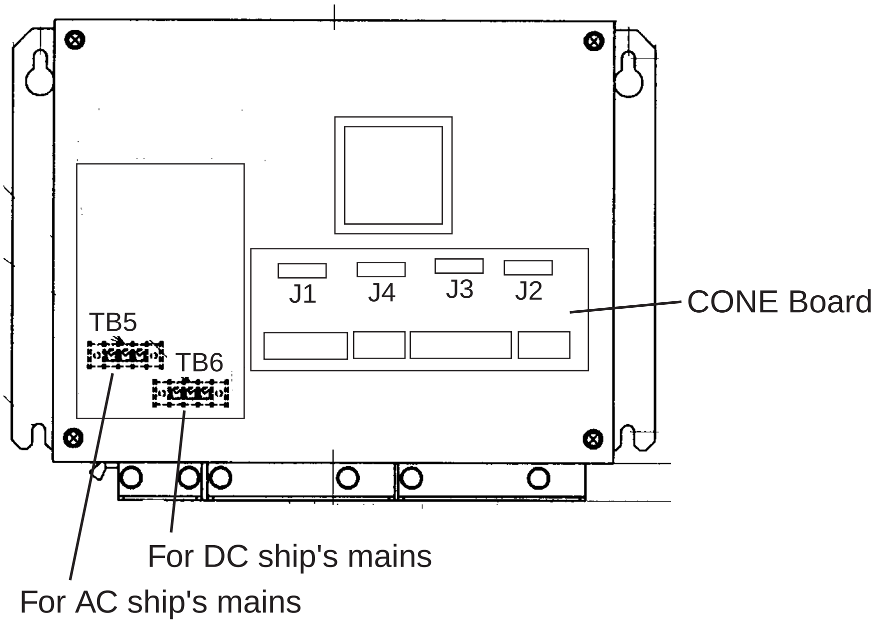
100 VAC, 110-115 VAC, 200 VAC Ship's Mains

1. Connect the power cable to #1 & #3 on TB5 in the distribution box.
2. Modify the wiring at TB7 according to ship's mains as shown in the table below.

Ship's mains	TB7 #1	TB7 #2	TB7 #3	TB7 #4	TB7 #5
220-230 VAC (Default)	Orange	Red	Black	Brown	White
200 VAC	Red	Orange	Black	Brown	White
110-115 VAC	Black	Red	Orange	Brown	White
100VAC	Brown	Red	Black	Orange	White

24 VDC Ship's Mains

1. Remove the cover of the distribution box.
2. Remove P3 connector from J4 on the CONE Board.
3. Reattach P3 connector to J3 on the CONE Board.
4. Connect the power cable to TB6.



Distribution box, inside view

4. ADJUSTMENTS

This section provides the procedures for initial set up of the equipment. The type of transducer used should be properly set before operating the equipment.

4.1 Transducer Setting

Select the type of transducer used as follows.

1. Press the POWER Switch while pressing any key. Release the key when the following display appears.

EXTENSION MODE	
+ :	TRANSDUCER SETTING
– :	TEST
▲:	CLEAR MEMORY
▼:	DEMONSTRATION

2. Press the [+] key to select TRANSDUCER SETTING.

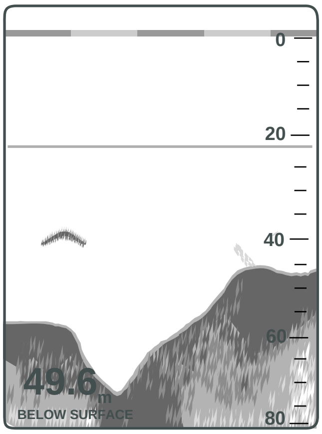
TRANSDUCER SETTING	
CHANGEOVER :	AUTO MANUAL
[FORE] XDR :	N/A 50kHz 200kHz
KEEL DIST. :	0.0 m(0.0-10.0)
[AFT] XDR :	N/A 50 kHz 200kHz
KEEL DIST. :	0.0 m(0.0-10.0)
DEPTH(BELOW)	TRANSDUCER KEEL
DISP MODE :	DUAL SINGLE
DISP ORDER*:	AFT/FORE FORE/AFT
OUTPUT* :	FORE AFT
MEMORIZE* :	DUAL FORE AFT
:	To select item
– +:	To set option

* Does not appear when DISP MODE is set to SINGLE.

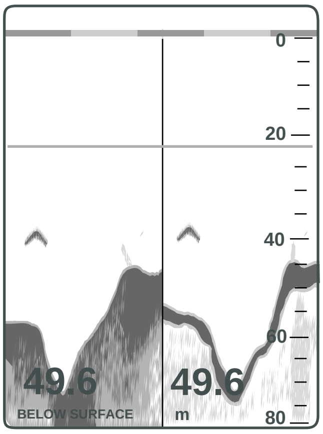
3. Set the transducer(s) as shown below. Use [▲] or [▼] to select an item and [+] or [–] to set option.
   a) CHANGEOVER sets how transducer(s) is connected to the FE-700. Select MANUAL for single transducer or transducers connected via Switch Box EX-8. Select AUTO for connection via Distribution Box MB-1200.
   b) **One transducer installed**: Set FORE XDR to 50 kHz or 200 kHz, depending on actual installation. Leave AFT XDR set to “N/A."

      Two transducers installed: Set FORE XDR and AFT XDR to 50 kHz or 200 kHz, depending on actual installation.
   c) KEEL DIST sets the distance from transducer to keel of the ship.
   d) DEPTH (BELOW) selects the method of depth indication. TRANSDUCER for depth indication below the transducer (except DBS mode), or KEEL for depth indication below the keel.
   e) DISP MODE sets the function of the MODE switch in case of dual frequencies. Select DUAL to show the dual frequency display (fore and aft), or SINGLE to show single frequency display.

Note: If CHANGEOVER is set for MANUAL, select SINGLE.



SINGLE: Single frequency



DUAL: Dual frequency

f) DISP ORDER sets where to locate the fore and aft displays (right or left side) in the dual frequency display.

g) OUTPUT sets what data to output to external equipment (in IEC/NMEA data format) in case of dual frequencies. Select FORE to output FORE data, or AFT to output AFT data.

h) MEMORIZE sets the source (transducer) for data recording (depth, etc.) in case of dual frequencies. Select DUAL, FORE or AFT as appropriate. DUAL records both FORE and AFT data for 12 hours. FORE or AFT records respective data for 24 hours.

4. Reset the power.

Note: The default settings in the TRANSDUCER SETTING window are N/A. At the first power-up after installation, the window appears to set transducer(s).

4.2 Setting the Time

1. Open the system menu 2 referring to the operator’s manual.

SYSTEM MENU 2		
MENU SELECT	1 2 3	
TIME ADJUST	INTERNAL EXTERNAL	
DAY	1	
MONTH	JAN	
YEAR	2009	(2100)
HOUR	0	(0 23)
MINUTE	1	(0 59)
SECOND	42	(0 59)
01 JAN 2009	00:01:06	
▼▲:	To select item	
– +:	To set option	
Select other mode to exit.		

System menu 2

2. Press [▼] key to select TIME ADJUST. Select INTERNAL to use the internal clock. Set day, month, year, hour, minute and second with [+] or [-] key. Select EXTERNAL to use time data from equipment that outputs time in ZDA format. At TIME DIFFERENCE field, select AUTO or MANUAL. MANUAL requires entry of time difference.

SYSTEM MENU 2		
MENU SELECT	1 2 3	
TIME ADJUST	INTERNAL	EXTERNAL
TIME DIFFERENCE	AUTO	MANUAL
01 JAN 2009	00:02:10	
▼▲:	To select item	
– +:	To set option.	
Select other mode to exit.		

TIME ADJUST set to EXTERNAL

SYSTEM MENU 2		
MENU SELECT	1 2 3	
TIME ADJUST	INTERNAL	EXTERNAL
TIME DIFFERENCE	AUTO	MANUAL
TIME DIFF HOUR	0	(0~13)
TIME DIFF MIN	0	(0~59)
TIME DIFF SIGN	-	(0~59)
01 JAN 2009	00:02:10	
▼▲:	To select item	
– +:	To set option.	
Select other mode to exit.		

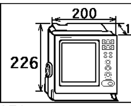
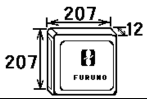
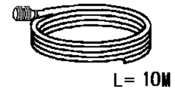
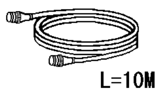
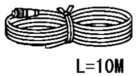
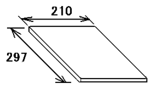
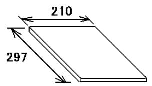
TIME DIFFERENCE set to MANUAL

PACKING LIST

FE-701/FE-701-HK

02FI-X-9851 -9 1/1

A-1

NAME	OUTLINE	DESCRIPTION/CODE No.	Q'TY
ユニット UNIT			
指示器 DISPLAY UNIT		FE-701/FE-701-HK 000-015-871-00 **	1
付属品 ACCESSORIES		FP02-04800	
ﾊｰﾄﾞｶﾊﾞｰ HARD COVER		FP02-04802 001-390-000-00	1
付属品 ACCESSORIES		FP02-04801 001-389-860-00	1
工事材料 INSTALLATION MATERIALS		CP02-06400	
工事材料 INSTALLATION MATERIALS		CP02-06401 001-229-260-00	1
ｹｰﾌﾞﾙ組品 CABLE ASSY.		FM-C6FPS002-100 000-142-781-00	1
ｹｰﾌﾞﾙ組品MJ CABLE ASSY.		MJ-A10SPF0002-100 000-126-659-00	1
ｹｰﾌﾞﾙ組品MJ CABLE ASSY.		MJ-A3SPF0015-100C 000-156-054-11	1
図書 DOCUMENT			
取扱説明書 OPERATOR'S MANUAL		OME-23660-* 000-808-908-1*	1
装備要領書 INSTALLATION MANUAL		IME-23660-* 000-808-910-1*	1

Outline dimensions as printed: display unit 200, 17, 226; hard cover 207, 12, 207; cable assemblies L= 10M, L=10M, L=10M; manuals 210 × 297.

ｺｰﾄﾞ番号末尾の[**]は、選択品の代表ｺｰﾄﾞを表します。
CODE NUMBER ENDING WITH "**" INDICATES THE CODE NUMBER OF REPRESENTATIVE MATERIAL.

型式/ｺｰﾄﾞ番号が2段の場合、下段より上段に代わる過渡期品であり、どちらかが入っています。 なお、品質は変わりません。
TWO TYPES AND CODES MAY BE LISTED FOR AN ITEM. THE LOWER PRODUCT MAY BE SHIPPED IN PLACE OF THE UPPER PRODUCT. QUALITY IS THE SAME.
(略図の寸法は、参考値です。 DIMENSIONS IN DRAWING FOR REFERENCE ONLY.)

02FI-X-9851

A-2

FURUNO

CODE NO.	001-229-260-00	02FI-X-9402 -2
TYPE	CP02-06401	1/1

工事材料表

INSTALLATION MATERIALS

番号 NO.	名称 NAME	略図 OUTLINE	型名／規格 DESCRIPTIONS	数量 Q'TY	用途／備考 REMARKS
1	ﾌｨﾙﾀ(EMI) FILTER		ESD-SR-150 CODE NO. 000-149-159-00	1	

Outline dimension as printed: 37

型式/ｺｰﾄﾞ番号が２段の場合、下段より上段に代わる過渡期品であり、どちらかが入っています。 なお、品質は変わりません。

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（略図の寸法は、参考値です。 DIMENSIONS IN DRAWING FOR REFERENCE ONLY.）

FURUNO ELECTRIC CO., LTD.

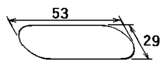
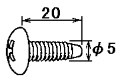
02FI-X-9402

FURUNO

CODE NO.	001-389-860-00	02FG-X-9501 -3
TYPE	FP02-04801	1/1

付属品表

ACCESSORIES

番号 NO.	名称 NAME	略図 OUTLINE	型名／規格 DESCRIPTIONS	数量 Q'TY	用途／備考 REMARKS
1	ﾌﾞﾗｲﾝﾄﾞﾌｨﾙﾑ(K) DUMMY FILM(K)		03-118-1103-0 ROHS CODE NO. 100-185-380-10	1	
2	+ﾄﾗｽﾀｯﾋﾟﾝﾈｼﾞ 1ｼｭ SELF-TAPPING SCREW		5X20 SUS304 CODE NO. 000-162-608-10	4	

型式/ｺｰﾄﾞ番号が２段の場合、下段より上段に代わる過渡期品であり、どちらかが入っています。 なお、品質は変わりません。

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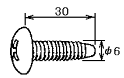
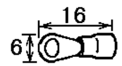
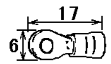
（略図の寸法は、参考値です。 DIMENSIONS IN DRAWING FOR REFERENCE ONLY.）

FURUNO

CODE NO.	001-228-950-00	02FI-X-9401 -2
TYPE	CP02-06301	1/1

工事材料表

INSTALLATION MATERIALS

番号 NO.	名称 NAME	略図 OUTLINE	型名／規格 DESCRIPTIONS	数量 Q'TY	用途／備考 REMARKS
1	+ﾄﾗｽﾀｯﾋﾟﾝﾈｼﾞ 1ｼｭ SELF-TAPPING SCREW		6X30 SUS304 CODE NO. 000-162-614-10	4	
2	圧着端子 CRIMP-ON LUG		FV1.25-3(LF) CODE NO. 000-166-756-10	10	
3	圧着端子 CRIMP-ON LUG		FV2-S3.3 FV2-S3.3 ｱｵ CODE NO. 000-157-234-10 000-538-117-00	10	

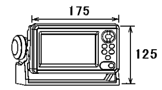
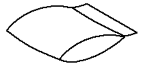
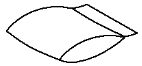
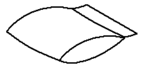
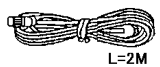
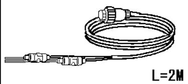
型式/ｺｰﾄﾞ番号が２段の場合、下段より上段に代わる過渡期品であり、どちらかが入っています。 なお、品質は変わりません。

TWO TYPES AND CODES MAY BE LISTED FOR AN ITEM. THE LOWER PRODUCT MAY BE SHIPPED IN PLACE OF THE UPPER PRODUCT. QUALITY IS THE SAME.

（略図の寸法は、参考値です。 DIMENSIONS IN DRAWING FOR REFERENCE ONLY.）

PACKING LIST

FE-720/HK

NAME	OUTLINE	DESCRIPTION/CODE No.	Q'TY
ユニット UNIT			
深度表示器 DIGITAL DEPTH INDICATOR		FE-720/FE-720-HK 000-029-025-00 **	1
付属品 ACCESSORIES		**FP65-00400**	
ﾌﾗｯｼｭﾏｳﾝﾄF FLUSH MOUNTING PANEL		FP65-00401 002-889-360-00	1
ﾌﾗｯｼｭﾏｳﾝﾄS FLUSH MOUNTING PANEL		FP65-00402 002-889-370-00	1
付属品 ACCESSORIES		FP65-00403 002-889-380-00	1
工事材料 INSTALLATION MATERIALS		**CP02-06700**	
工事材料 INSTALLATION MATERIALS		CP65-00801 002-889-350-00	1
ｹｰﾌﾞﾙ組品MJ CABLE ASSY.		MJ-A6SPF0003-020C 000-154-029-10	1
ｹｰﾌﾞﾙ組品MJ CABLE ASSY.		MJ-A7SPF0009-020C MJ-A7SPF0009-020 000-159-686-10 000-145-612-00	1

ｺｰﾄﾞ番号末尾の[**]は、選択品の代表ｺｰﾄﾞを表します。
CODE NUMBER ENDING WITH "**" INDICATES THE CODE NUMBER OF REPRESENTATIVE MATERIAL.

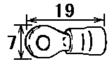
型式/ｺｰﾄﾞ番号が2段の場合、下段より上段に代わる過渡期品であり、どちらかが入っています。 なお、品質は変わりません。
TWO TYPES AND CODES MAY BE LISTED FOR AN ITEM. THE LOWER PRODUCT MAY BE SHIPPED IN PLACE OF THE UPPER PRODUCT. QUALITY IS THE SAME.
(略図の寸法は、参考値です。 DIMENSIONS IN DRAWING FOR REFERENCE ONLY.)

FURUNO

CODE NO.	002-889-350-00	65AD-X-9406 -1
TYPE	CP65-00801	1/1

工事材料表

INSTALLATION MATERIALS

番号 NO.	名称 NAME	略図 OUTLINE	型名／規格 DESCRIPTIONS	数量 Q'TY	用途／備考 REMARKS
1	圧着端子 CRIMP-ON LUG		FV0.5-4(LF) CODE NO. 000-166-665-10	20	

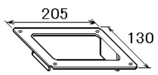
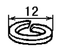
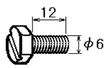
型式/ｺｰﾄﾞ番号が２段の場合、下段より上段に代わる過渡期品であり、どちらかが入っています。 なお、品質は変わりません。
TWO TYPES AND CODES MAY BE LISTED FOR AN ITEM. THE LOWER PRODUCT MAY BE SHIPPED IN PLACE OF THE UPPER PRODUCT. QUALITY IS THE SAME.
（略図の寸法は、参考値です。 DIMENSIONS IN DRAWING FOR REFERENCE ONLY.）

FURUNO ELECTRIC CO., LTD.

FURUNO

CODE NO.	002-889-360-00	65AD-X-9502 -3
TYPE	FP65-00401	1/1

付属品表
ACCESSORIES

番号 NO.	名称 NAME	略図 OUTLINE	型名／規格 DESCRIPTIONS	数量 Q'TY	用途／備考 REMARKS
1	化粧パネル COSMETIC PANEL		20-016-1051-0 CODE NO. 100-251-370-10	1	
2	バネ座金 SPRING WASHER		M6 SUS304 CODE NO. 000-158-855-10	2	
3	六角スリワリ ボルト HEX.BOLT(SLOTTED HEAD)		M6X12 SUS304 CODE NO. 000-162-897-10	2	

型式/コード番号が２段の場合、下段より上段に代わる過渡期品であり、どちらかが入っています。 なお、品質は変わりません。

TWO TYPES AND CODES MAY BE LISTED FOR AN ITEM. THE LOWER PRODUCT MAY BE SHIPPED IN PLACE OF THE UPPER PRODUCT. QUALITY IS THE SAME.

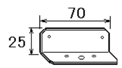
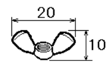
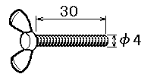
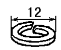
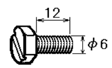
（略図の寸法は、参考値です。 DIMENSIONS IN DRAWING FOR REFERENCE ONLY.）

FURUNO ELECTRIC CO ., LTD. 65AD-X-9502

FURUNO

CODE NO.	002-889-370-00	65AD-X-9504 -5
TYPE	FP65-00402	1/1

付属品表
ACCESSORIES

番号 NO.	名称 NAME	略図 OUTLINE	型名／規格 DESCRIPTIONS	数量 Q'TY	用途／備考 REMARKS
1	フラッシュマウント FIXING PLATE FOR FLUSH MOUNT		20-007-2401-0 ROHS CODE NO. 100-183-190-10	2	
2	蝶ナット WING NUT		M4 YBSC2 CODE NO. 000-168-239-10	4	
3	蝶ボルト WING SCREW		M4X30 YBSC2 CODE NO. 000-168-243-10	4	
4	バネ座金 SPRING WASHER		M6 SUS304 CODE NO. 000-158-855-10	2	
5	六角スリワリ ボルト HEX.BOLT(SLOTTED HEAD)		M6X12 SUS304 CODE NO. 000-162-897-10	2	

型式/コード番号が２段の場合、下段より上段に代わる過渡期品であり、どちらかが入っています。 なお、品質は変わりません。

TWO TYPES AND CODES MAY BE LISTED FOR AN ITEM. THE LOWER PRODUCT MAY BE SHIPPED IN PLACE OF THE UPPER PRODUCT. QUALITY IS THE SAME.

（略図の寸法は、参考値です。 DIMENSIONS IN DRAWING FOR REFERENCE ONLY.）

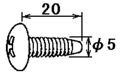
FURUNO ELECTRIC CO ., LTD. 65AD-X-9504

FURUNO

CODE NO.	002-889-380-00	65AD-X-9503 -1
TYPE	FP65-00403	1/1

付属品表

ACCESSORIES

番号 NO.	名称 NAME	略図 OUTLINE	型名／規格 DESCRIPTIONS	数量 Q'TY	用途／備考 REMARKS
1	+トラスタッピンネジ 1シュ SELF-TAPPING SCREW	 	5X20 SUS304 CODE NO. 000-162-609-10	4	

型式/コード番号が２段の場合、下段より上段に代わる過渡期品であり、どちらかが入っています。 なお、品質は変わりません。

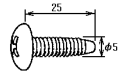
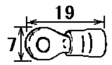
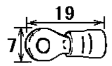
TWO TYPES AND CODES MAY BE LISTED FOR AN ITEM. THE LOWER PRODUCT MAY BE SHIPPED IN PLACE OF THE UPPER PRODUCT. QUALITY IS THE SAME.
（略図の寸法は、参考値です。 DIMENSIONS IN DRAWING FOR REFERENCE ONLY.）

FURUNO

CODE NO.	002-888-480-00	65AD-X-9403 -2
TYPE	CP65-00903	1/1

工事材料表

INSTALLATION MATERIALS

番号 NO.	名称 NAME	略図 OUTLINE	型名／規格 DESCRIPTIONS	数量 Q'TY	用途／備考 REMARKS
1	+トラスタッピンネジ 1シュ SELF-TAPPING SCREW	 	5X25 SUS304 CODE NO. 000-162-610-10	4	
2	圧着端子 CRIMP-ON LUG	 	FV0.5-4(LF) CODE NO. 000-166-665-10	20	
3	圧着端子 CRIMP-ON LUG	 	FV2-M4 FV2-M4 CODE NO. 000-157-229-10 000-536-716-00	30	

型式/コード番号が２段の場合、下段より上段に代わる過渡期品であり、どちらかが入っています。 なお、品質は変わりません。

TWO TYPES AND CODES MAY BE LISTED FOR AN ITEM. THE LOWER PRODUCT MAY BE SHIPPED IN PLACE OF THE UPPER PRODUCT. QUALITY IS THE SAME.
（略図の寸法は、参考値です。 DIMENSIONS IN DRAWING FOR REFERENCE ONLY.）

FURUNO

CODE NO.	001-228-890-00	02FI-X-9301 -4 1/1
TYPE	SP02-04101	BOX NO. P

SHIP NO.	SPARE PARTS LIST FOR	U S E	SETS PER VESSEL

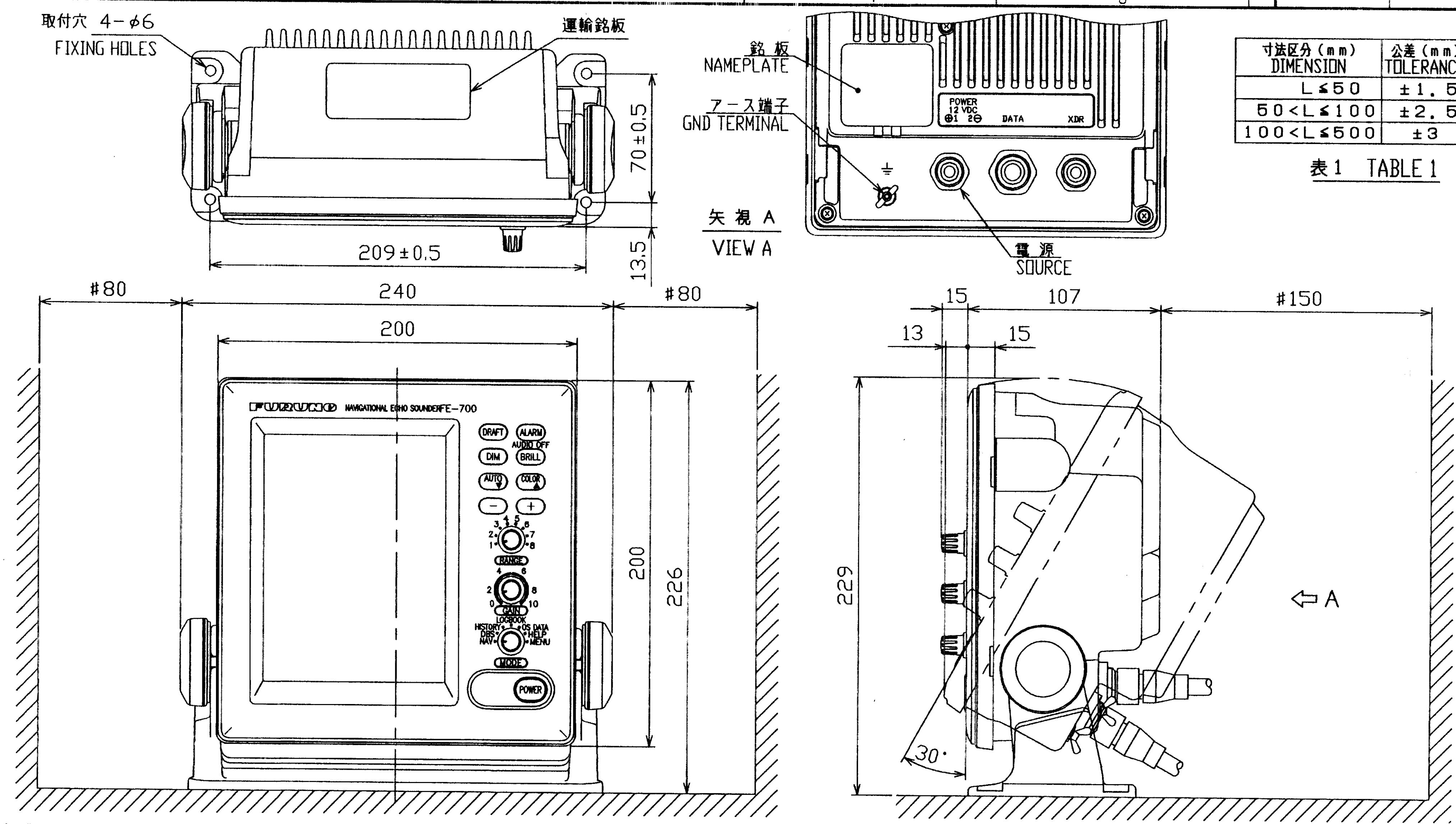
ITEM NO.	NAME OF PART	OUTLINE	DWG. NO. OR TYPE NO.	QUANTITY WORKING PER SET	QUANTITY WORKING PER VES	QUANTITY SPARE	REMARKS/CODE NO.
1	ﾋｭｰｽﾞ GLASS TUBE FUSE	20, ϕ5	FGMB 125V 0.5A PBF	1		3	000-157-462-10
2	ﾋｭｰｽﾞ GLASS TUBE FUSE	20, ϕ5	FGMB 125V 3A PBF	1		3	000-157-481-10
3	ﾋｭｰｽﾞ GLASS TUBE FUSE	20, ϕ5	FGMB 250V 3A PBF	1		3	000-157-568-10

MFR'S NAME	FURUNO ELECTRIC CO.,LTD.	DWG NO.	02FI-X-9301	1/1

（略図の寸法は、参考値です。 DIMENSIONS IN DRAWING FOR REFERENCE ONLY.）

型式/ｺｰﾄﾞ番号が２段の場合、下段より上段に代わる過渡期品であり、どちらかが入っています。 なお、品質は変わりません。

TWO TYPES AND CODES MAY BE LISTED FOR AN ITEM. THE LOWER PRODUCT MAY BE SHIPPED IN PLACE OF THE UPPER PRODUCT. QUALITY IS THE SAME.



寸法区分 (mm) DIMENSION	公差 (mm) TOLERANCE
L≦50	±1.5
50<L≦100	±2.5
100<L≦500	±3

表1 TABLE 1

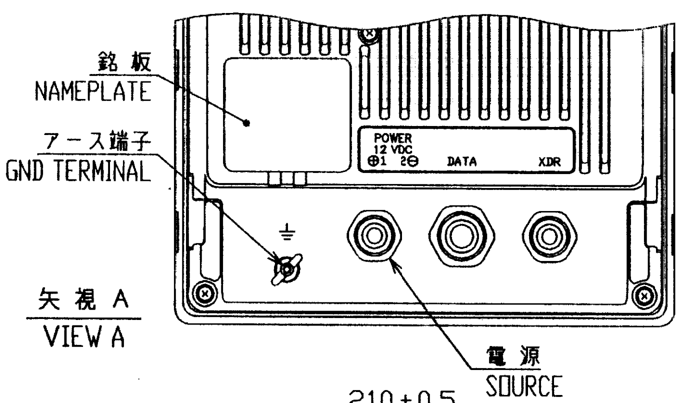
注記 1） #印寸法は最小サービス空間寸法とする。
2） 指定外の寸法公差は表1による。
3） 取付用ネジはトラスタッピンネジ呼び径５×２０を使用のこと。

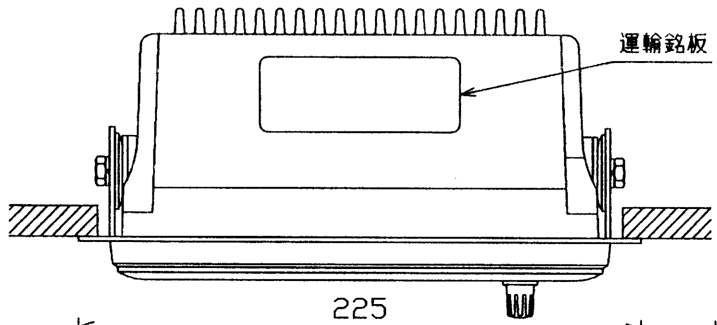
NOTE 1. #: RECOMMENDED SERVICE CLEARANCE.
2. TABLE 1 INDICATES TOLERANCE OF DIMENSIONS.
3. USE TAPPING SCREWS 5x20 FOR FIXING THE UNIT.

DRAWN Sep. 17 '01 T.YAMASAKI		TITLE FE-701
CHECKED Sep 18 '01 Y.Kin		名称 指示器（卓上装備）
APPROVED Sep 18 '01 Y.Kin	FE-700	外寸図
SCALE 1/3 MASS 2.6 ±10% kg		NAME DISPLAY UNIT (DESKTOP MOUNT)
DWG No. C2366-G01-B	02-129-170G-2	OUTLINE DRAWING

FURUNO ELECTRIC CO., LTD.

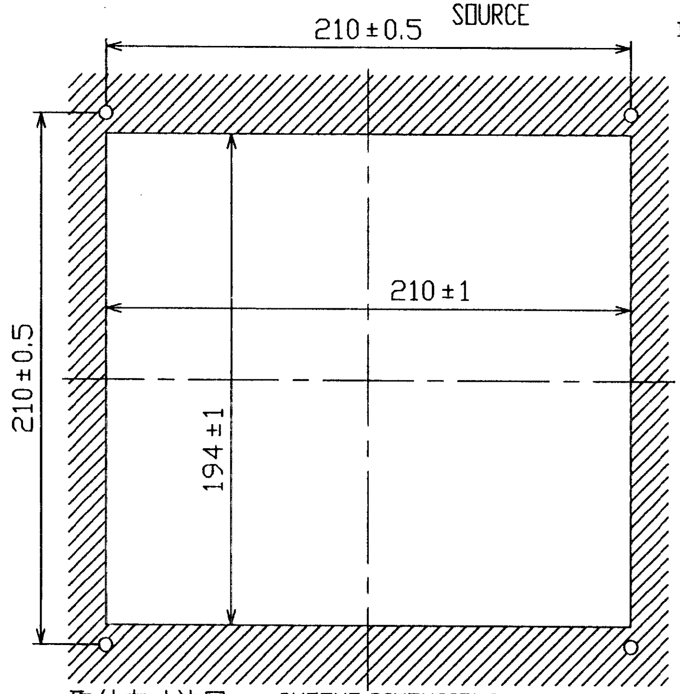
FURUNO



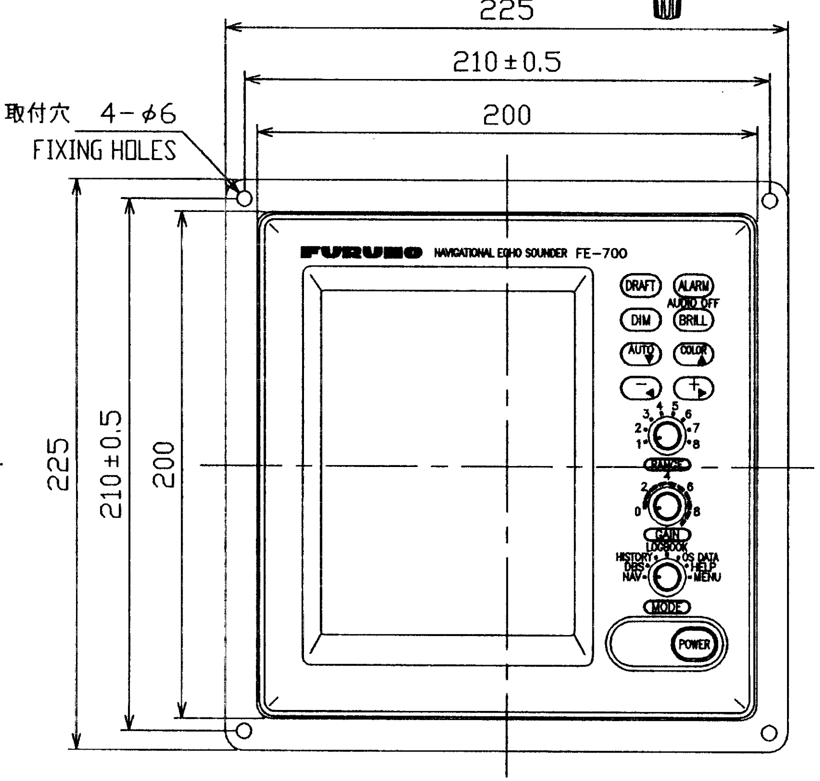


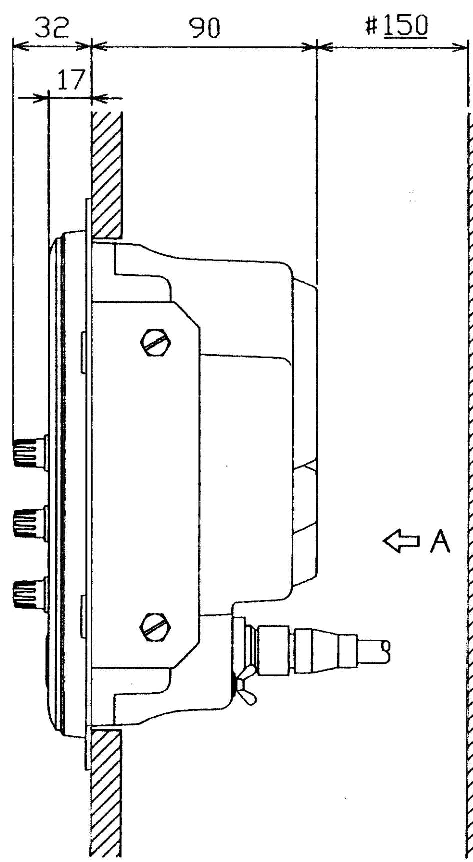
寸法区分 (mm) DIMENSION	公差 (mm) TOLERANCE
L≦50	±1.5
50<L≦100	±2.5
100<L≦500	±3

表1 TABLE 1



取付穴寸法図 CUTOUT DIMENSIONS





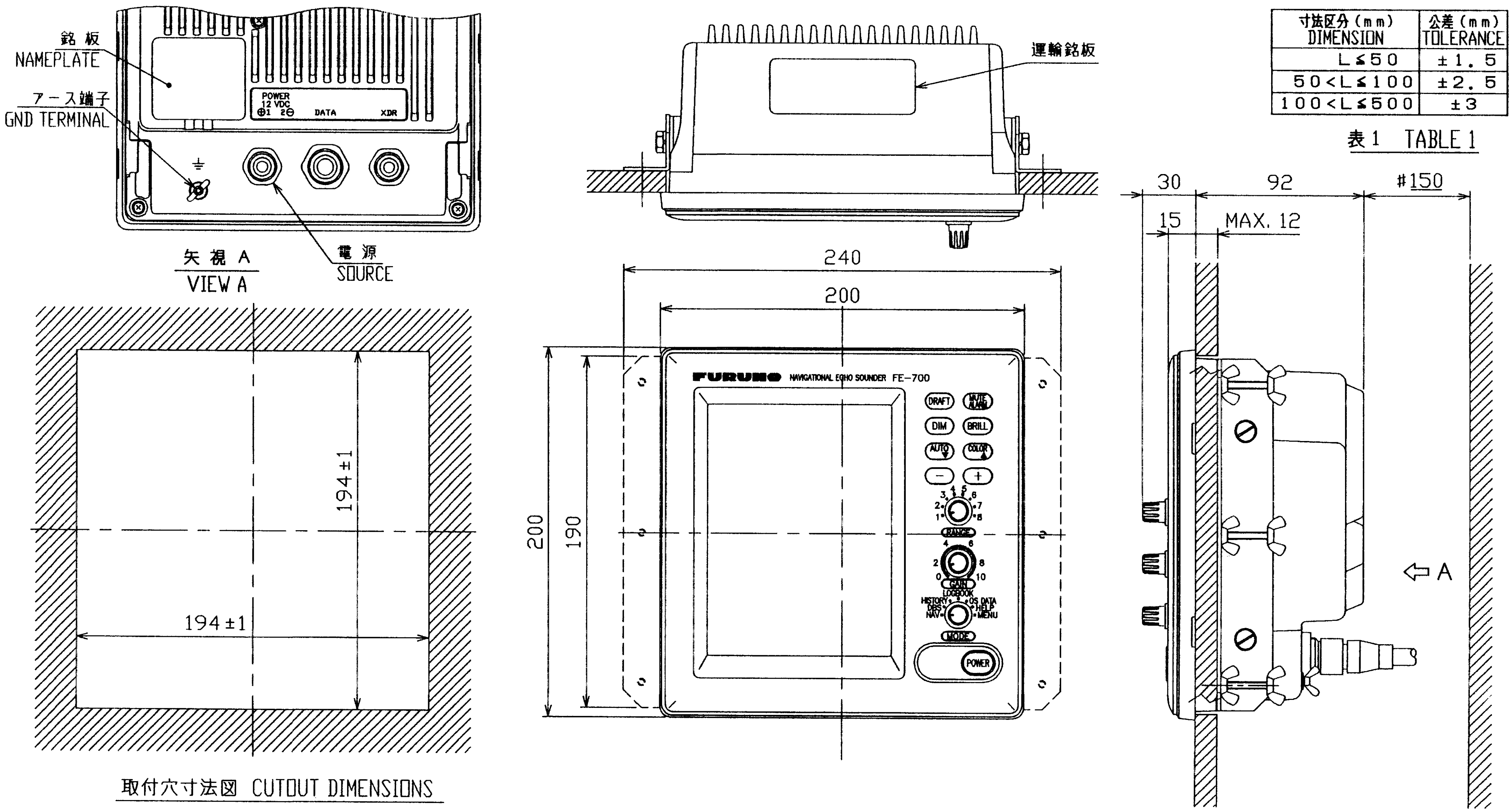
注 記 1) #印寸法は最小サービス空間寸法とする。
2) 指定外の寸法公差は表1による。
3) 取付用ネジはM5ボルトまたはタッピンネジ呼び径5×20を使用のこと。

NOTE 1. #: RECOMMENDED SERVICE CLEARANCE.
2. TABLE 1 INDICATES TOLERANCE OF DIMENSIONS.
3. USE TAPPING SCREWS 5x20 FOR FIXING THE UNIT.

DRAWN Sep. 17 '01 T.YAMASAKI		TITLE FE-701
CHECKED Sep. 18 '01 Y.Ki		名称 指示器（埋込装備F）
APPROVED Sep. 18 '01 Y.Ki	FE-700	外寸図
SCALE 1/3 MASS 2.4 ±10% kg		NAME DISPLAY UNIT (FLUSH MOUNT F)
DWG No. C2366-G03-B	02-129-180G-2	OUTLINE DRAWING

FURUNO ELECTRIC CO., LTD.

FURUNO



寸法区分 (mm) DIMENSION	公差 (mm) TOLERANCE
L≦50	±1.5
50＜L≦100	±2.5
100＜L≦500	±3

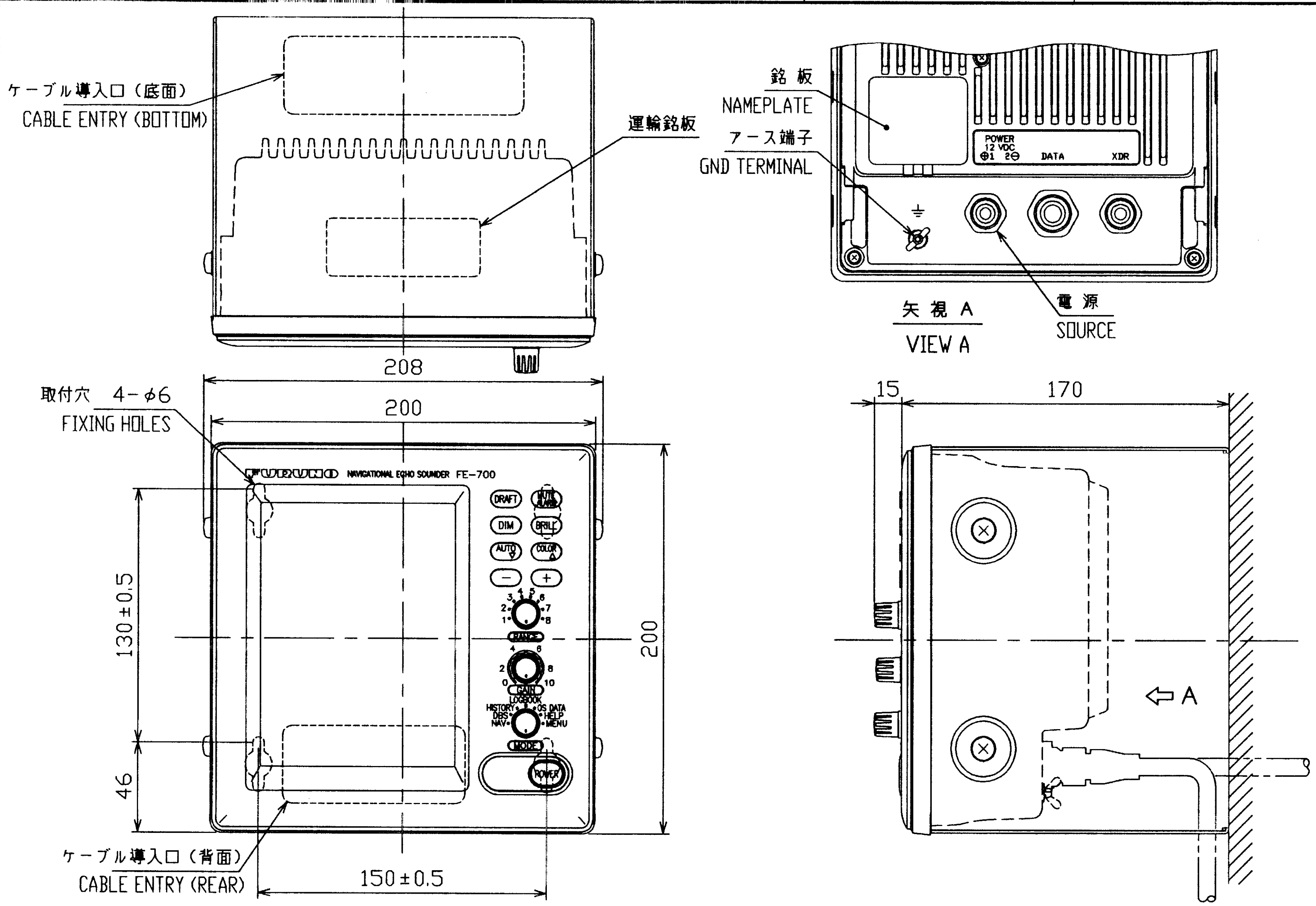
表1 TABLE 1

注 記 1） #印寸法は最小サービス空間寸法とする。
2） 指定外の寸法公差は表1による。

NOTE 1. #: RECOMMENDED SERVICE CLEARANCE.
2. TABLE 1 INDICATES TOLERANCE OF DIMENSIONS.

DRAWN Sep. 17 '01 T.YAMASAKI		TITLE	FE-701
CHECKED Sep 18 '01 Y.K.		名称	指示器（埋込装備S）
APPROVED Sep 18 '01 Y.K.	FE-700		外寸図
SCALE 1/3 MASS 2.4 ±10% kg		NAME	DISPLAY UNIT (FLUSH MOUNT S)
DWG No. C2366-G04-B	02-129-190G-2		OUTLINE DRAWING

FURUNO ELECTRIC CO., LTD.



寸法区分 (mm) DIMENSION	公差 (mm) TOLERANCE
L≦50	±1.5
50＜L≦100	±2.5
100＜L≦500	±3

表1 TABLE 1

注 記 1）取付用ネジはM5ボルトまたはタッピンネジ呼び径5×20を使用のこと。
2）指定外の寸法公差は表1による。

NOTE 1. USE M5 BOLTS OR TAPPING SCREWS 5×20 FOR FIXING UNIT.
2. TABLE 1 INDICATES TOLERANCE OF DIMENSIONS.

DRAWN Sep. 17 '01 T.YAMASAKI		TITLE FE-701
CHECKED		名称 指示器（壁掛装備）
APPROVED	FE-700	外寸図
SCALE 1/3 MASS 3.7±10% kg		NAME DISPLAY UNIT (BULKHEAD MOUNT)
DWG No. C2366-G08-B	02-129-140G-1	OUTLINE DRAWING

FURUNO ELECTRIC CO., LTD.

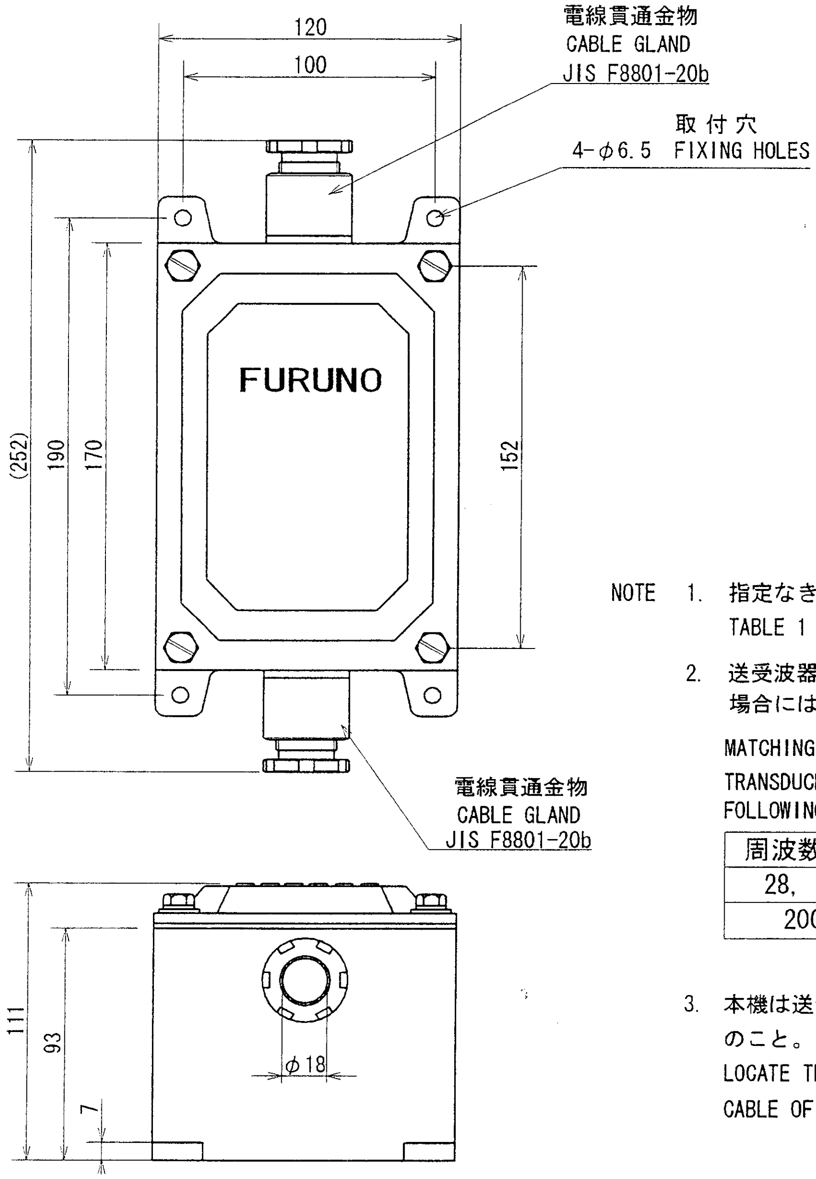


表１ TABLE 1

寸法区分(mm) DIMENSION	公差(mm) TOLERANCE
0 ＜ L ≦ 50	±1.5
50 ＜ L ≦ 100	±2.5
100 ＜ L ≦ 500	±3

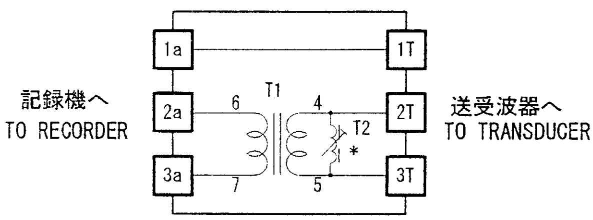
NOTE

1. 指定なき寸法公差は表１による。
TABLE 1 INDICATES TOLERANCE OF DIMENSIONS.

2. 送受波器ケーブルが次の長さを超える場合には本機を使用すること。
MATCHING BOX IS NEEDED WHEN THE TRANSDUCER CABLE EXCEEDS THE FOLLOWING LENGTH.

周波数 FREQ.	長さ LENGTH
28, 50 kHz	100 m
200 kHz	15 m

3. 本機は送受波器ケーブル（１５ｍ）端に取付のこと。
LOCATE THIS UNIT AT THE END OF TRANSDUCER CABLE OF 15m.

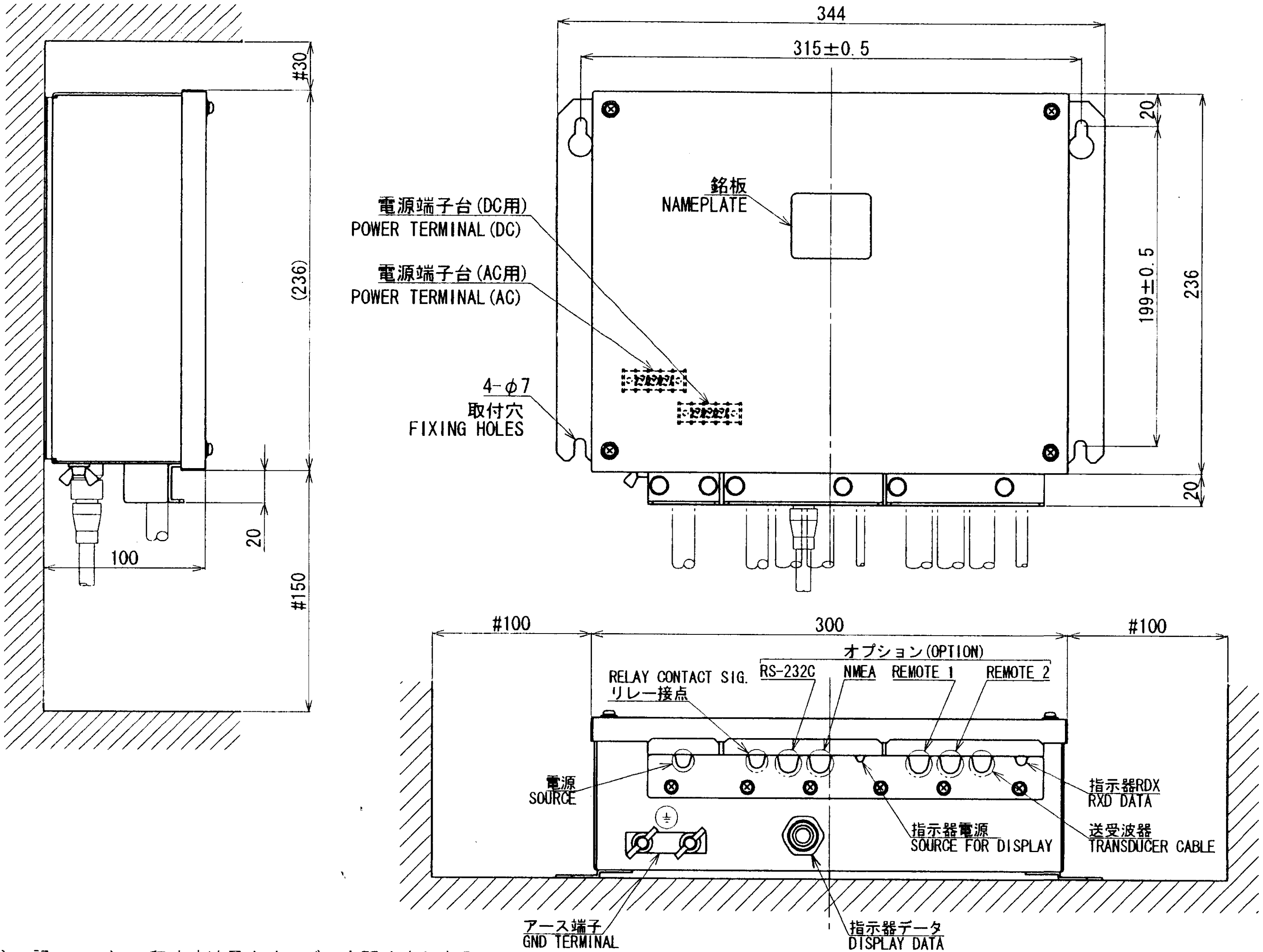


型式 TYPE	送受波器 TRANSDUCER	T1	T2
MB-501	28F-18 (28kHz)	T-205CJ	0.068uF
MB-502	50B-6B (50kHz)	T-203BJ	T-204B
MB-503	50B-9B (50kHz)	T-205BJ	T-206B
MB-504	200B-8B (200kHz)	T-205AJ	T-206A

DRAWN July 11 '00 T.YAMASAKI		TITLE	MB-501/502/503/504
CHECKED July 11 '00 Y. K.		名称	整合箱
APPROVED July 11 '00 Y. K.	FE-880/880T		外寸図
SCALE 1/3	MASS 2.6 kg	NAME	MATCHING BOX
DWG. No. C2006-006-E			OUTLINE DRAWING

FURUNO ELECTRIC CO., LTD.

FURUNO



寸法区分（mm） DIMENSION	公差（mm） TOLERANCE
L≦５０	±１．５
５０＜L≦１００	±２．５
１００＜L≦５００	±３

表 1
TABLE 1

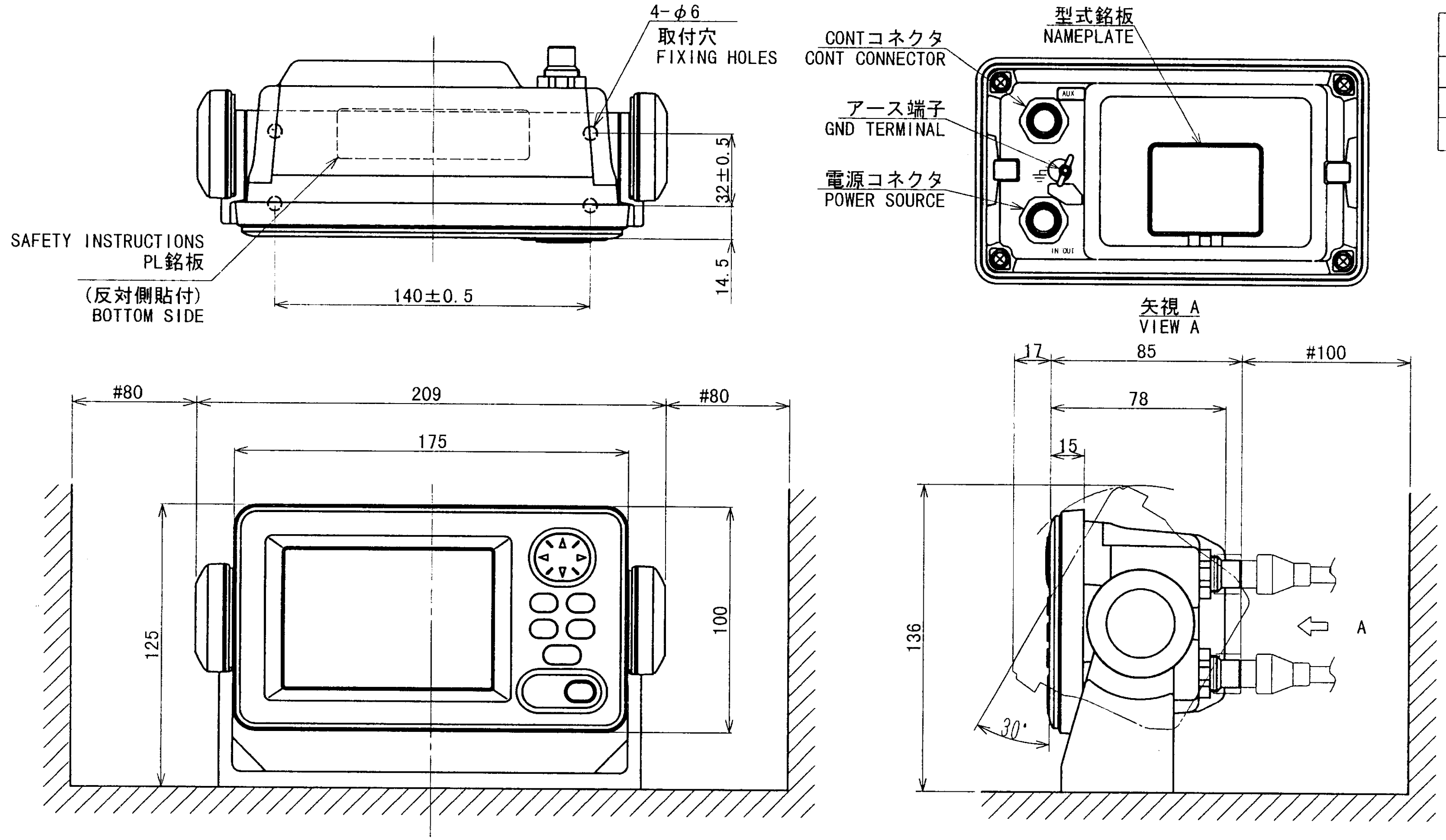
注　記　１）＃印寸法は最小サービス空間寸法とする。
２）指定外の寸法公差は表１による。
３）取付用ネジはトラスタッピンネジ6×30を使用のこと。

NOTE
1. #: RECOMMENDED SERVICE CLEARANCE.
2. TABLE 1 INDICATES TOLERANCE OF DIMENSIONS.
3. USE TAPPING SCREWS 6x30 FOR FIXING UNIT.

DRAWN Nov.27'00 T.YAMASAKI		TITLE	FE-702
CHECKED Nov.27'00 Y.Kim		名称	分配箱
APPROVED Nov.28'00 Y.Kim	FE-700		外寸図
SCALE 1/4	MASS 6.0 ±10% kg	NAME	DISTRIBUTION BOX
DWG. No. C2366-G02- B	02-129-2000-G2		OUTLINE DRAWING

FURUNO ELECTRIC CO., LTD.

FURUNO



寸法区分(mm) DIMENSION	公差(mm) TOLERANCE
L≦50	±1．5
50＜L≦100	±2．5
100＜L≦500	±3

表 1
TABLE 1

注　記

1）#印寸法は最小サービス空間寸法とする。
2）指定外寸法公差は表1による。
3）取付用ネジはトラスタッピンネジ5×20を使用のこと。
4）装備ケーブルはサービス時、指示部を前方に十分引き出せるよう余裕を持たせること。

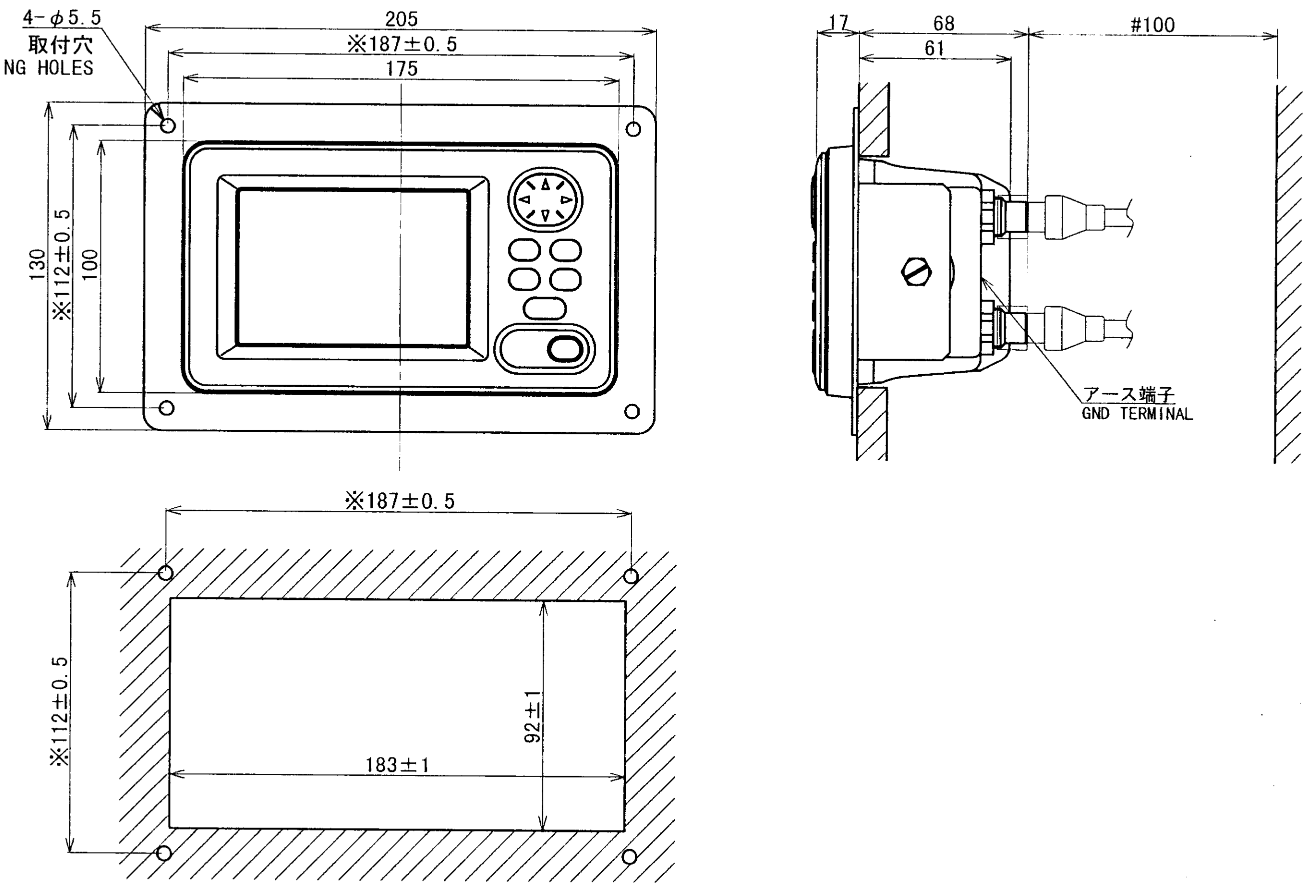
NOTE

1. #: RECOMMENDED SERVICE CLEARANCE.
2. TABLE 1 INDICATES TOLERANCE OF DIMENSIONS.
3. USE TAPPING SCREWS 5x20 FOR FIXING UNIT.
4. KEEP ENOUGH CABLE LENGTH BEHIND UNIT.

DRAWN Dec 7 '99 T. YAMASAKI		TITLE FE-720
CHECKED Dec 7 '99 K. Katsuoki		名称 深度表示器（卓上装備）
APPROVED Dec 7 '99 K. Katsuoki	FE-700	外寸図
SCALE 1/3	MASS 0.60 kg ±10%	NAME DEPTH INDICATOR (DESKTOP MOUNT)
DWG. No. C2366-G05- A	02-129-3000-G1	OUTLINE DRAWING

FURUNO ELECTRIC CO., LTD.

FURUNO



取付穴寸法図（参考図）
CUTTING DIMENSIONS

寸法区分 (mm) DIMENSION	公差 (mm) TOLERANCE
L≦50	±1.5
50<L≦100	±2.5
100<L≦500	±3

表 1 TABLE 1

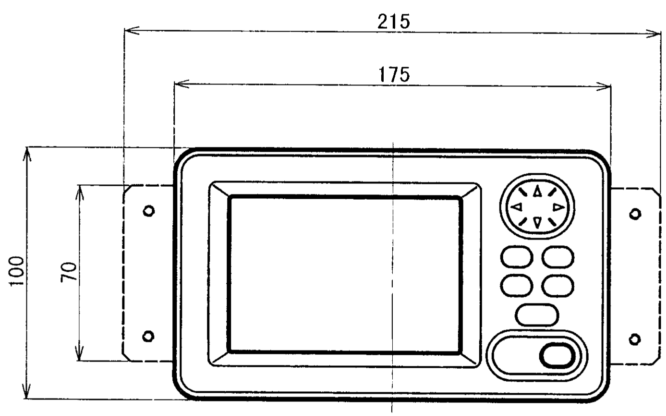
注 記
1）#印寸法は最小サービス空間寸法とする。
2）指定外の寸法公差は表１による。
3）取付用ネジはトラスタッピンネジ5×20を使用のこと。
4）※印寸法は取付穴位置寸法とする。

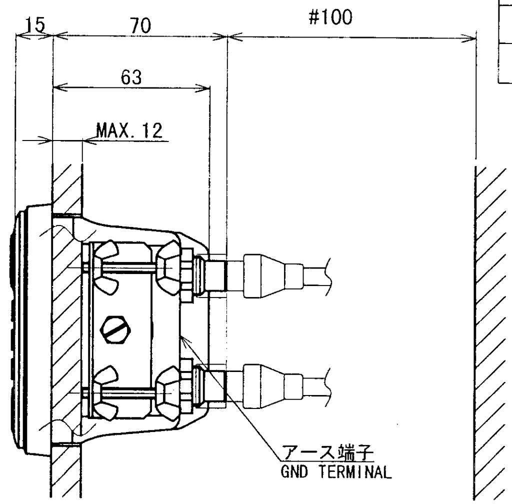
NOTE
1. #: RECOMMENDED SERVICE CLEARANCE.
2. TABLE 1 INDICATES TOLERANCE OF DIMENSIONS.
3. USE TAPPING SCREWS 5x20 FOR FIXING UNIT.
4. ※: DIMENSION OF FIXING HOLES PITCH.

DRAWN Dec.7 '99 T.YAMASAKI		TITLE	FE-720
CHECKED Dec.7 '99 K.Fusumoto		名称	深度表示器（埋込装備F）
APPROVED Dec.7 '99 K.Fusumoto	FE-700		外寸図
SCALE 1/3 MASS 0.55 kg ±10%		NAME	DEPTH INDICATOR (FLUSH MOUNT F)
DWG. No. C2366-G06- A	02-129-3010-G1		OUTLINE DRAWING

FURUNO ELECTRIC CO., LTD.

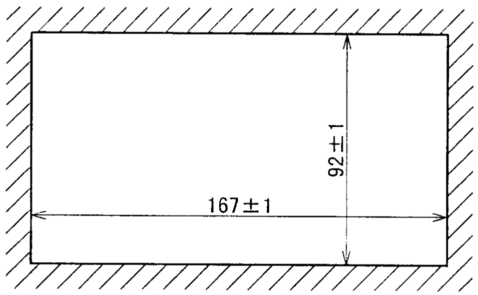
FURUNO





寸法区分(mm) DIMENSION	公差(mm) TOLERANCE
L≦50	±1.5
50<L≦100	±2.5
100<L≦500	±3

表 1
TABLE 1



取付穴寸法図（参考図）
CUTTING DIMENSIONS

注　記
1）#印寸法は最小サービス空間寸法とする。
1）指定外の寸法公差は表1による。

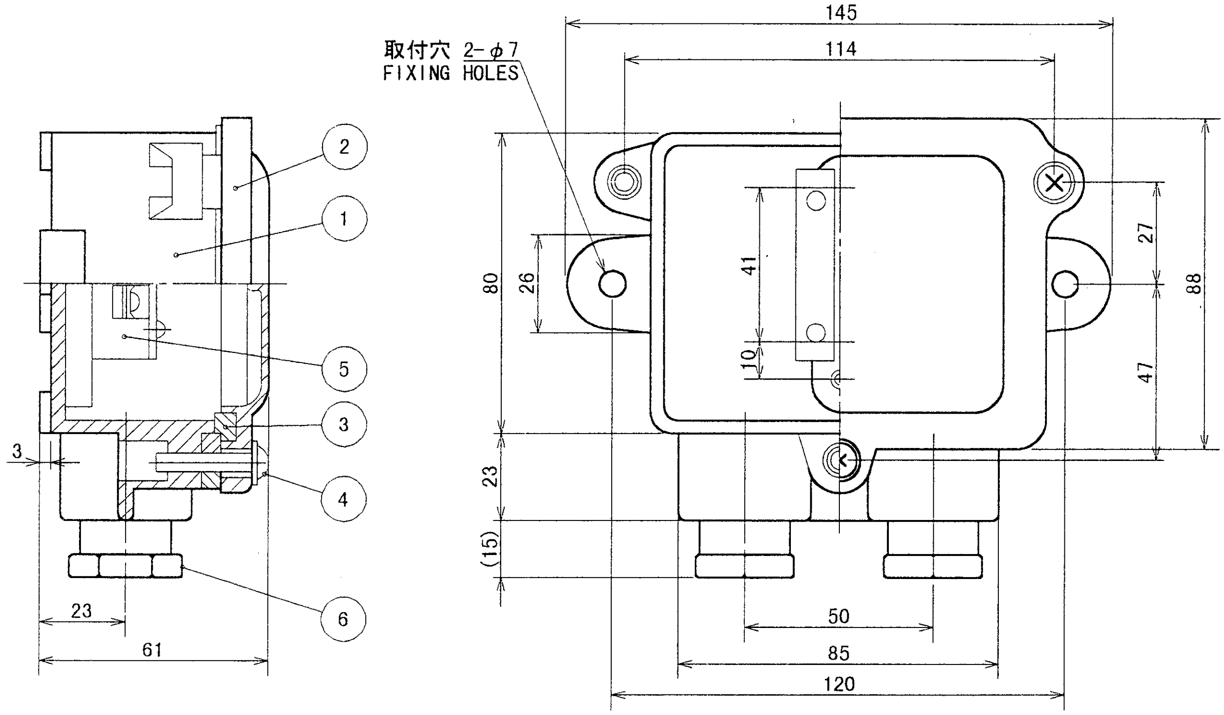
NOTE
1. #: RECOMMENDED SERVICE CLEARANCE.
1. TABLE 1 INDICATES TOLERANCE OF DIMENSIONS.

DRAWN Dec 7'99 T.YAMASAKI		TITLE	FE-720
CHECKED Dec 7'99 K.Kusunoki		名称	深度表示器（埋込装備S）
APPROVED Dec 7'99 K.Kusunoki	FE-700		外寸図
SCALE 1/3	MASS 0.55 kg ±10%	NAME	DEPTH INDICATOR(FLUSH MOUNT S)
DWG. No. C2366-G07- A	02-129-3020-G1		OUTLINE DRAWING

FURUNO ELECTRIC CO., LTD.

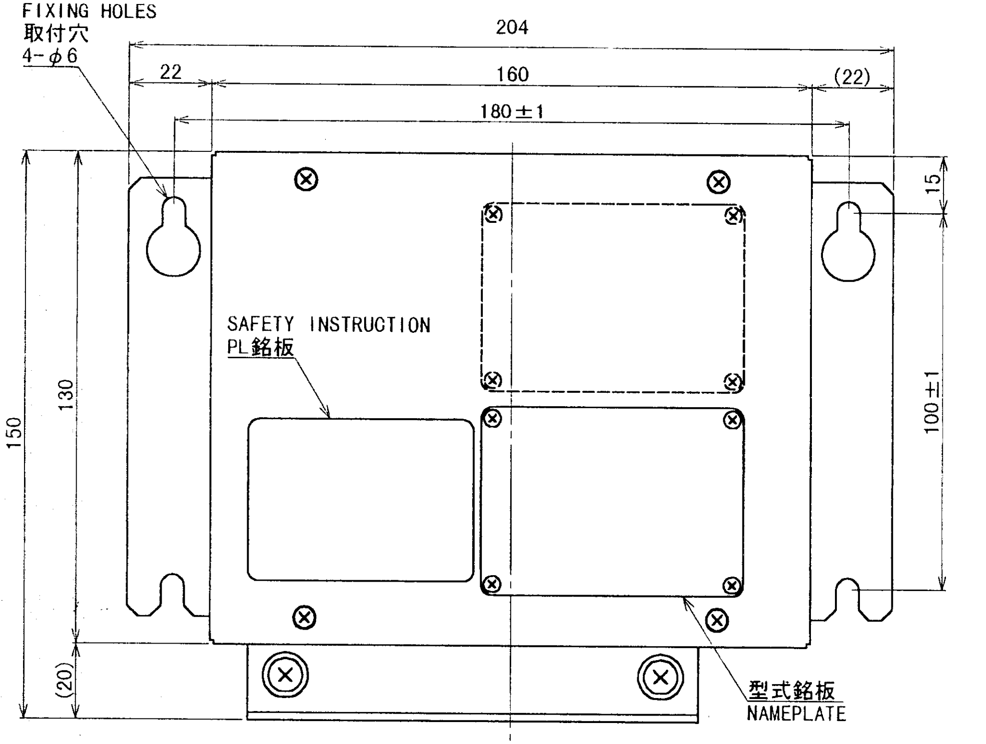
表1　TABLE 1

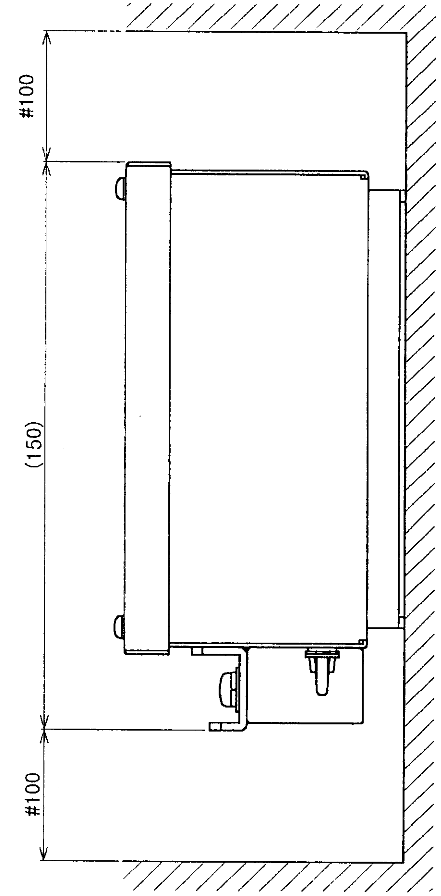
寸法区分(mm) DIMENSION	公差(mm) TOLERANCE
0 ＜ L ≦ 50	±1.5
50 ＜ L ≦ 100	±2.5
100 ＜ L ≦ 500	±3



品番 ITEM	品名 NAME	材質 MATERIAL	数量 Q'TY	図番 DWG. NO.	摘要 REMARKS
6	電線貫通金物 CABLE GLAND	P.B.T. 樹脂 RESIN	2		JIS F8801-20
5	端子盤 TERMINAL BOARD		1		JIS F8812-020-3
4	締付ねじ CLAMPING SCREW	真鍮 BRASS	3		
3	ガスケット GASKET	ネオプレン NEOPRENE	1		
2	蓋 COVER	P.B.T. 樹脂 RESIN	1		
1	箱体 BOX	P.B.T. 樹脂 RESIN	1		

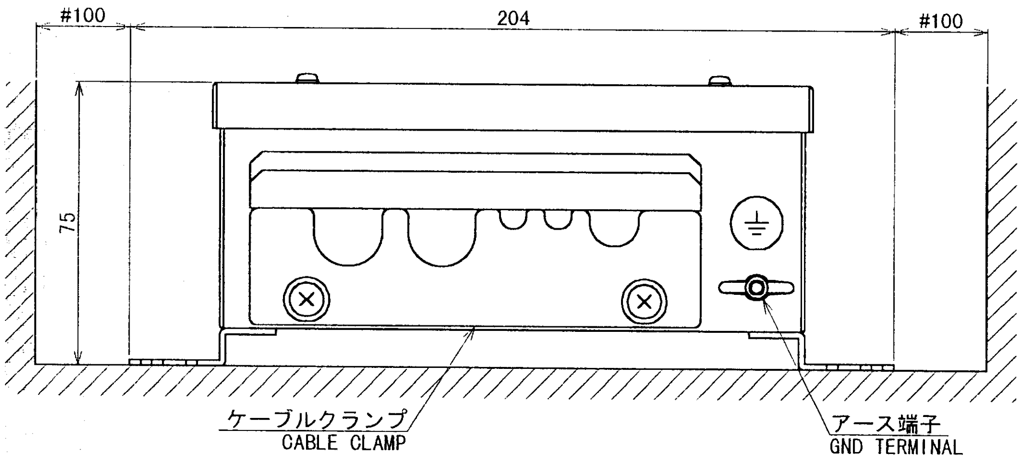
DRAWN July 5 '00 T. YAMASAKI	TITLE JIS F8821-1
CHECKED July 6 '00 T. Kim	名称 防水型船用小型接続箱
APPROVED July 6 '00 T. Kimura	外寸図
SCALE 1/2 　MASS ±10% 0.4 kg	NAME WATERTIGHT JUNCTION BOX
DWG. No. C0002-G01- B	OUTLINE DRAWING





寸法区分 (mm) DIMENSION	公差 (mm) TOLERANCE
0＜L≦50	±1．5
50＜L≦100	±2．5
100＜L≦500	±3

表 1
TABLE 1

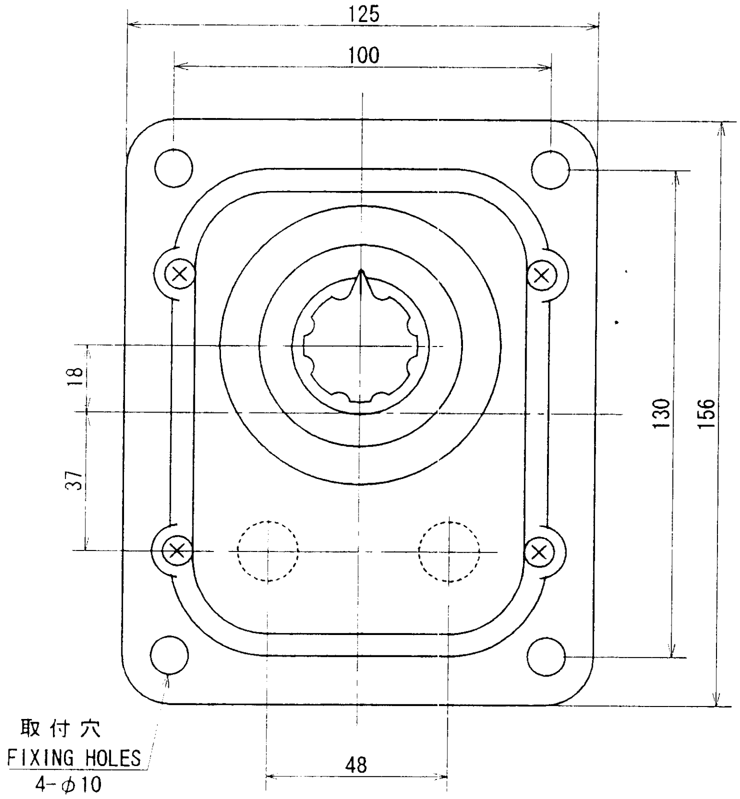


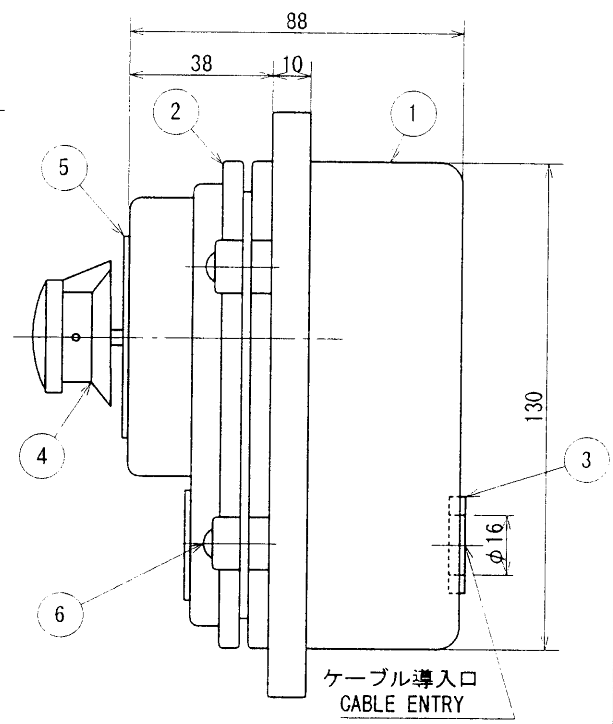
注 記
1） #印寸法は最小サービス空間寸法とする。
2） 指定外の寸法公差は表1による。
3） 取付用ネジはタッピングネジ呼び径5×20を使用のこと。

NOTE
1. #: RECOMMENDED SERVICE CLEARANCE.
2. TABLE 1 INDICATES TOLERANCE OF DIMENSIONS.
3. USE TAPPING SCREWS φ5x20 FOR FIXING UNIT.

DRAWN Feb.22'00 T.YAMASAKI
CHECKED Feb.22'00 K.Kusumoto
APPROVED Feb.22'00 K.Kusumoto
SCALE 1/2 MASS 1.1 kg ±10%
DWG. No. C7247-G06- B 66-072-7000-G2
TITLE DS-802
名称 端子台箱
外寸図
NAME TERMINAL BOX
OUTLINE DRAWING

FURUNO ELECTRIC CO., LTD.





注記

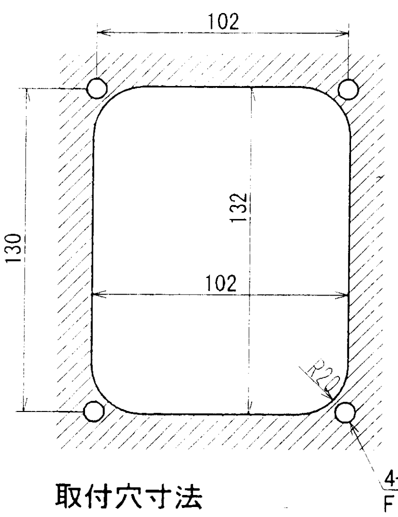
1）指定なき寸法公差は表１による。

NOTE

1. TABLE 1 INDICATES TOLERANCE OF DIMENSIONS.

表１　TABLE 1

寸法区分(mm) DIMENSION	公差(mm) TOLERANCE
0 ＜ L ≦ 50	±1.5
50 ＜ L ≦ 100	±2.5
100 ＜ L ≦ 500	±3



取付穴寸法

CUTOUT DIMENSIONS

縮尺 1/3
SCALE: 1/3

品番 ITEM	品名 NAME	材質 MATERIAL	数量 Q'TY	図番 DWG. No.	摘要 REMARKS
6	取付ネジ SET SCREW	BSBM2	1		
5	銘板 NAMEPLATE	SUS	1		
4	ノブ KNOB		1		
3	ブッシュ BUSH	RUBBER	2		
2	フタ COVER	AC7AF	1		
1	体 BODY	AC7AF	1		

DRAWN	July 12 '00 T.YAMASAKI
CHECKED	July 13 '00 Y.Koi
APPROVED	July 13 '00 Y.Koi
SCALE	1/2
MASS	1.2 kg
DWG. No.	C7213-027- F
TITLE	MF-22L-1
名称	調光器（埋込型） 外寸図
NAME	DIMMER (FLUSH MOUNT) OUTLINE DRAWING

FURUNO ELECTRIC CO., LTD.

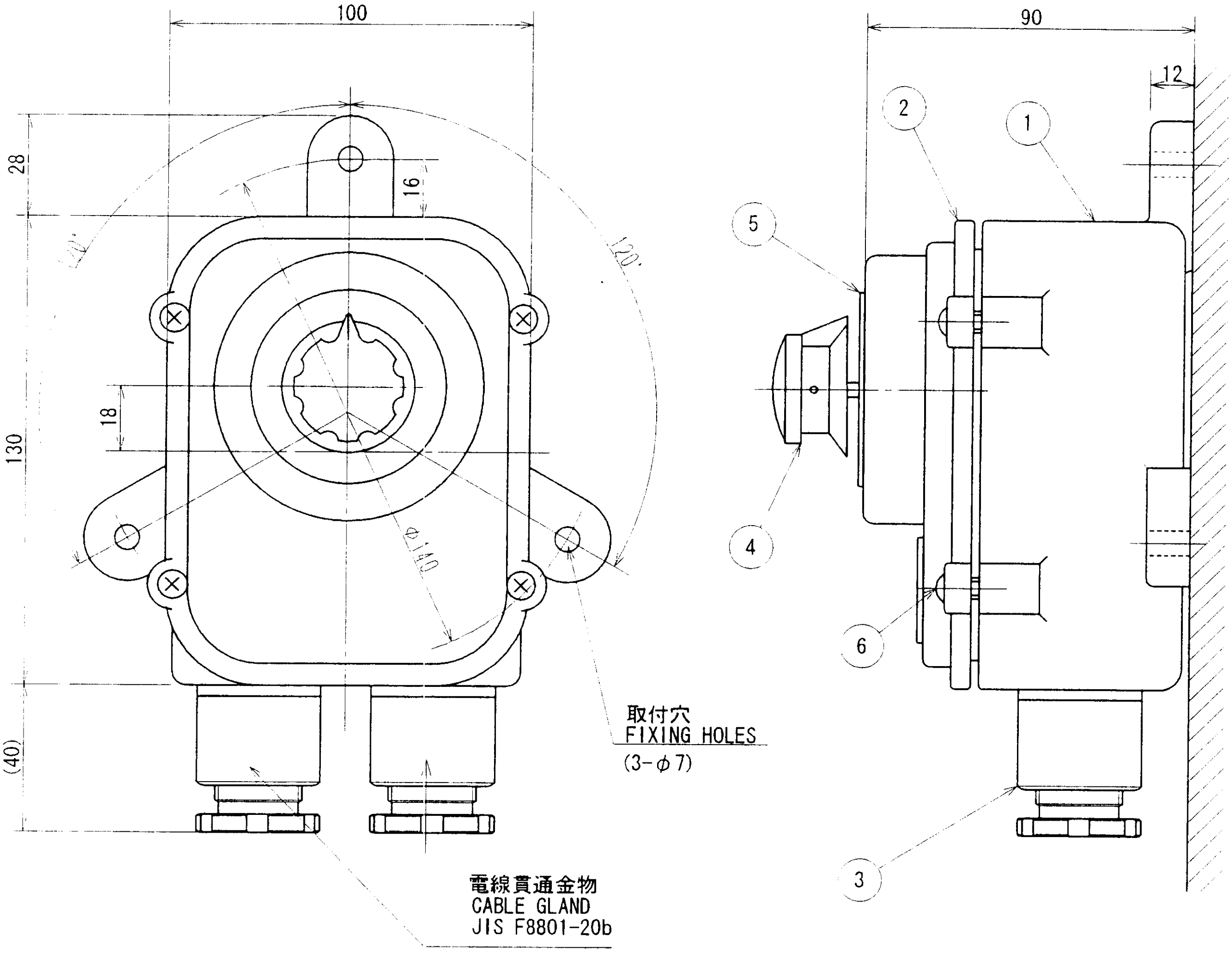


表1　TABLE 1

寸法区分(mm) DIMENSION	公差(mm) TOLERANCE
0 ＜ L ≦ 50	±1.5
50 ＜ L ≦ 100	±2.5
100 ＜ L ≦ 500	±3

注記
1）指定なき寸法公差は表1による。

NOTE
1. TABLE 1 INDICATES TOLERANCE OF DIMENSIONS.

品番 ITEM	品名 NAME	材質 MATERIAL	数量 Q'TY	図番 DWG. No.	摘要 REMARKS
6	取付ネジ SET SCREW	BUBM2	1		
5	銘板 NAMEPLATE	SUS	1		
4	ノブ KNOB		1		
3	グランド GLAND	AC7AF	2	JIS F8801-20b	
2	フタ COVER	AC7AF	1		
1	体 BODY	AC7AF	1		

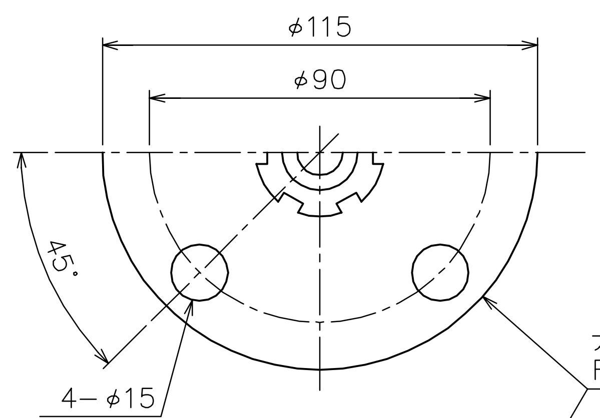
DRAWN	July 12 '00 T.YAMASAKI
CHECKED	July 13 '00 Y.Kimi
APPROVED	July 13 '00 Y.Kimi
SCALE	1/2
MASS	1.3 kg
DWG. No.	C7213-033- G
TITLE	MF-22L-2
名称	調光器（壁掛型）外寸図
NAME	DIMMER (BULKHEAD MOUNT) OUTLINE DRAWING

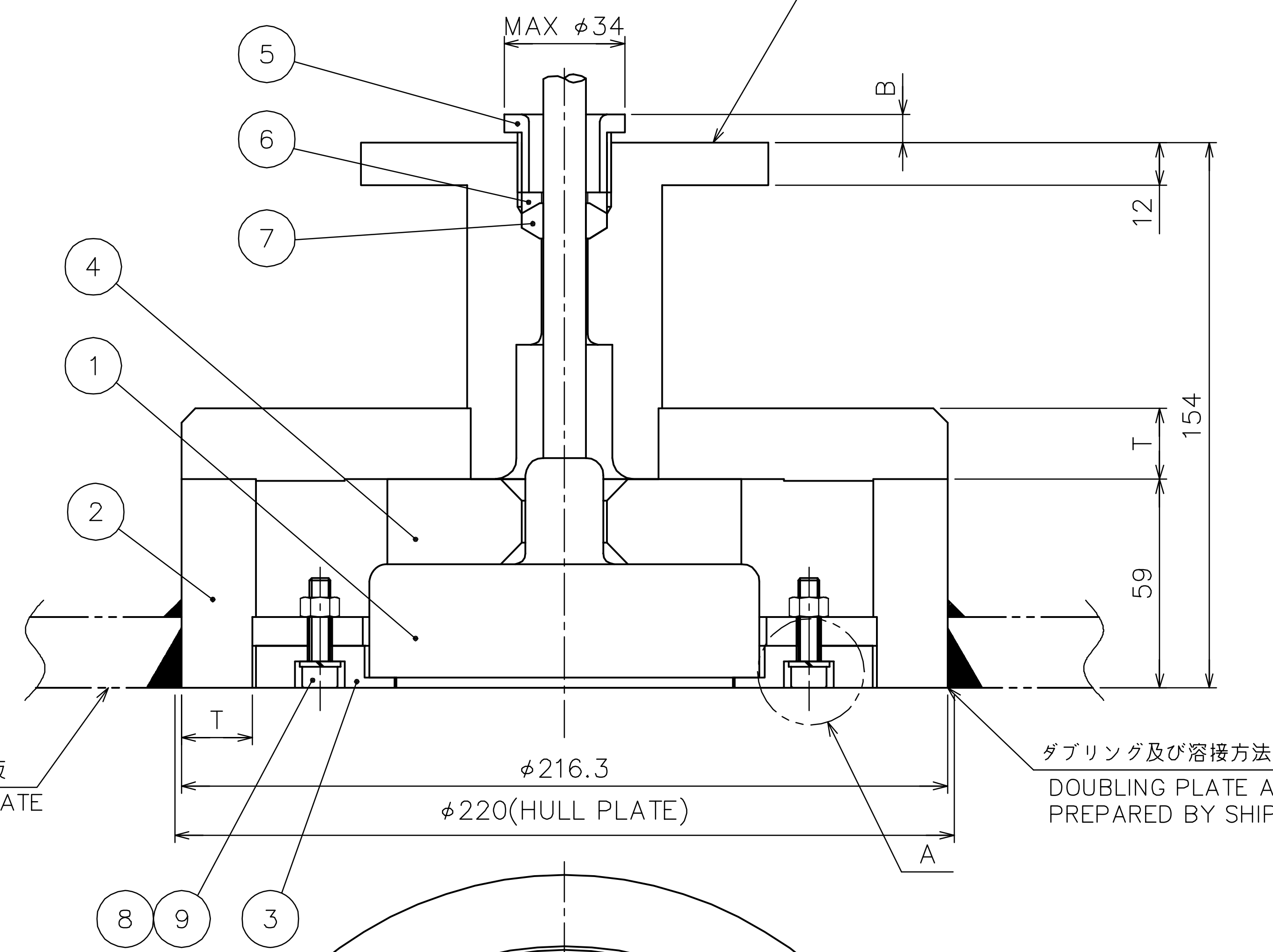
FURUNO ELECTRIC CO., LTD.

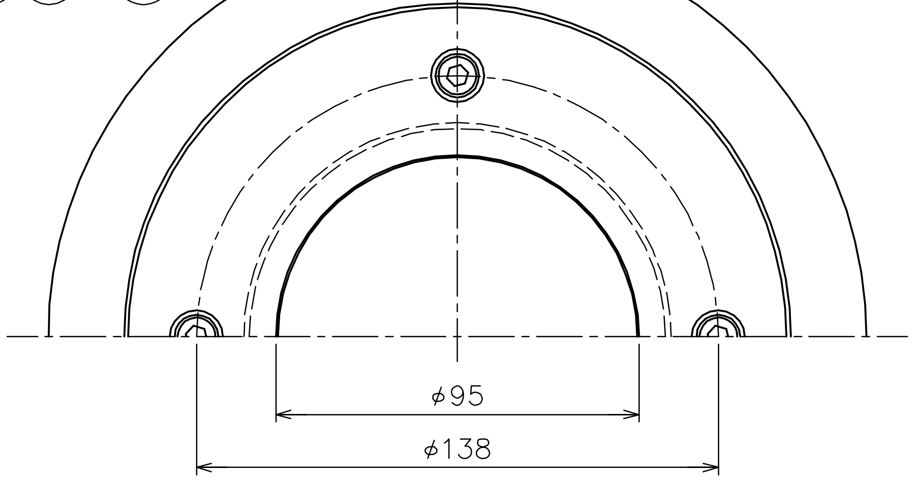
	D-13
周波数 FREQUENCY	200 KHz

表2 (Table2)

寸法区分 (mm) Dimensions	公差 (mm) Tolerance
L≦50	±1.5
50<L≦100	±2.5
100<L≦500	±3







注記：
1. タンク下面は船底板と面一とし、船底板より凹まないように装備してください。
2. 船底板とタンクを溶接する際は、②タンク本体溶接部分の表面処理を剥がし、歪み防止のため①送受波器／④押えゴム／⑦ゴムパッキンを取り外し、③取付フランジを必ず取付けて施工してください。
3. ②タンク本体の材質はNK（日本海事協会）規格のKSTPG370です。その化学成分を表1に示します。
4. タンクにはエピコンジンクリッチプライマーＢ－２（中国塗料）を塗布しています。
5. 塗装する際は、送受波器面を塗装しないように注意してください。
6. ①送受波器取付け後、A部および②タンク本体と③取付フランジの隙間をシリコン等で埋めてください。
7. ⑤締付けグランドは、図中B寸法が7.5～7.0mmになるように締付けてください。
8. 寸法公差は表2の通りです。
9. 質量には①送受波器を含みません。

NOTE:
1. THE TRANSDUCER TANK SHOULD BE WELDED FLUSH WITH SHIP'S HULL PLATE, AND SHOULD NOT RECEDE FROM THE HULL PLATE.
2. SCRAPE OFF SURFACE PLATING OF WELDING PART OF CASING ② BEFORE WELDING. TO AVOID DISTORTION BY HEAT, PUT FIXING FLANGE ③ WITHOUT TRANSDUCER ①, DAMPER ④ AND GASKET ⑦ ONTO CASING ② WHILE WELDING.
3. MATERIAL OF CASING ② MEETS NK (NIPPON KAIJI KYOUKAI) STANDARD KSTPG370. TABLE 1 INDICATES CHEMICAL COMPOSITION OF KSTPG370.
4. THE TRANSDUCER TANK IS FINISHED BY EPICON ZINC RICH PRIMER B−2 (CHUGOKU MARINE PAINTS,LTD.).
5. DO NOT PAINT TRANSDUCER FACE.
6. FILL THE SPACE OF POSITION 'A' AND THE GAP BETWEEN CASING ② AND FIXING FLANGE ③ WITH SILICONE SEALANT AFTER MOUNTING THE TRANSDUCER ①.
7. TIGHTEN GLAND NUT ⑤ SO THAT DIMENSION 'B' IS BETWEEN 7.0 mm AND 7.5 mm.
8. TABLE 2 INDICATES TOLERANCE OF DIMENSIONS.
9. MASS DOES NOT INCLUDE TRANSDUCER ①.

表 1 (Table 1)

化学成分 Chemical Composition	C	Si	Mn	P	S	Cr	Mo
含有量(%) Content(%)	0.25以下 or less	0.35以下 or less	0.30~0.90	0.040以下 or less	0.040以下 or less	なし Nil	なし Nil

表3 (Table3)

板厚寸法 (mm) Thickness		本体質量 (kg) MASS of TANK
標準品 Standard	T＝20	20 ± 10%
指定品 Optional	T＝12	16 ± 10%
	T＝25	22 ± 10%

船底厚に応じて板厚Tを選択ください
CHOOSE THICKNESS "T" ACCORDING TO THICKNESS OF HULL PLATE.

品番 ITEM	品名 NAME	材質 MATERIAL	数量 Q'TY	図番 DWG.NO.	摘要 REMARKS
9	バネ座金 SPRING WASHER	SUS316L	4	M6	
8	六角穴付きボルト HEX.S.H.C.SCREW	SUS316L	4	M6×25	
7	ゴムパッキン GASKET	CR	1	TPB-11-08	
6	座金 WASHER	C3604B	1	TPB-11-07	
5	締付けグランド GLAND NUT	C3604B	1	JIS F8801 20 1a	
4	押えゴム DAMPER	CR	1	TTF-2000-03	
3	取付フランジ FIXING FLANGE	SUS316L	1	TTF-2000-02	
2	タンク本体 CASING EPOXY ZINC RICH PRIMER	KSTPG370	1	TTF-2000-05	船級認定材 CLASSIFICATION SOCIETY APPROVED MATERIAL
1	送受波器 TRANSDUCER		1	200B-8B	表3質量には含まず NOT INCLUDED IN MASS.

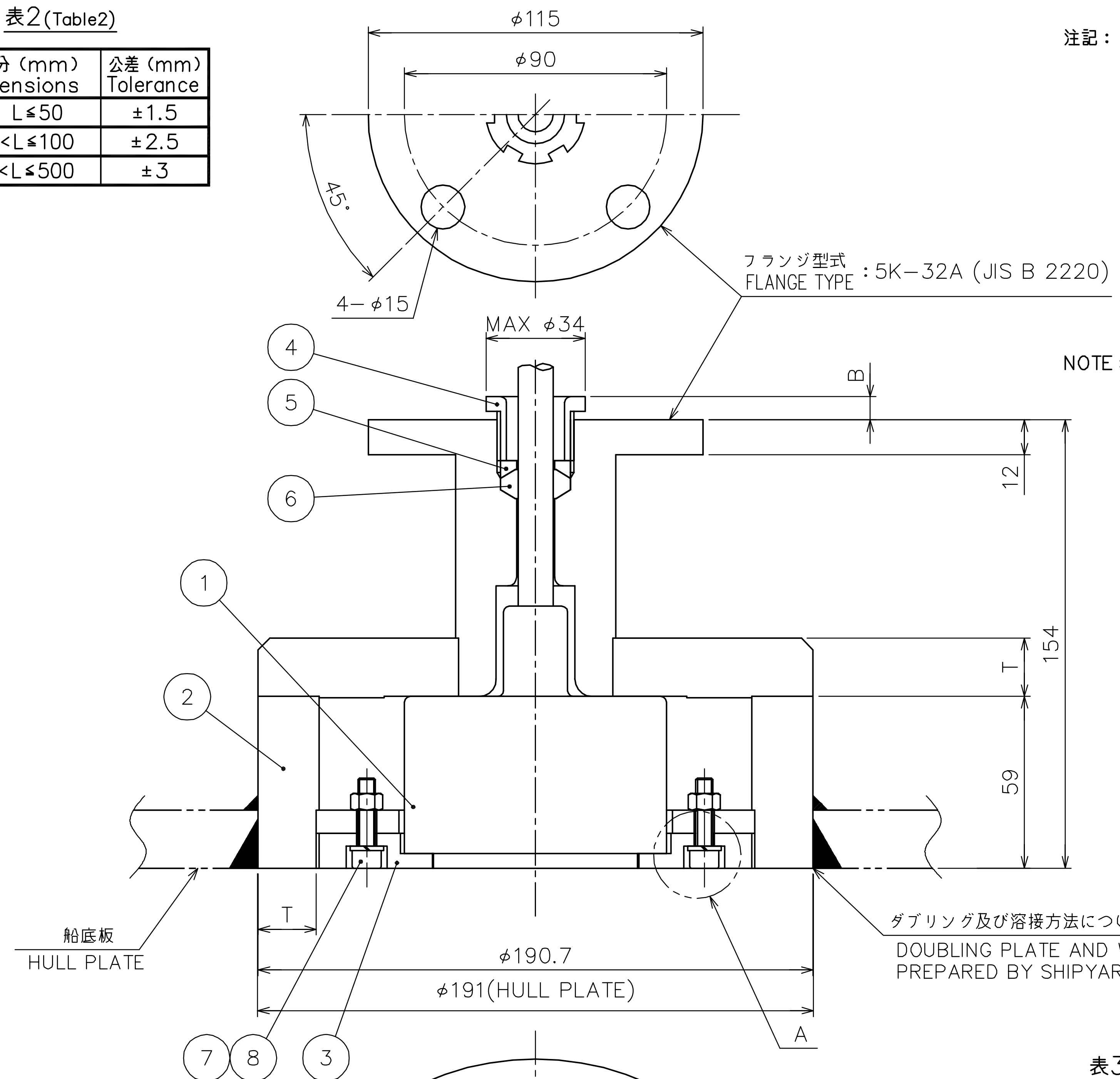
DRAWN	Mar. 14, '06 E. MIYOSHI	TITLE	TTF-2000 (5K-32A)
CHECKED	TAKAHASHI. T	名称	送受波器(200kHz)タンク 送受波器装備図
APPROVED	Y. Hatai		
SCALE 1/2	MASS 表3 TABLE 3 ±10% kg	NAME	TRANSDUCER (200 kHz) TANK TRANSDUCER INSTALLATION
DWG No. C2001-332-X	02-TTF-205G-0		

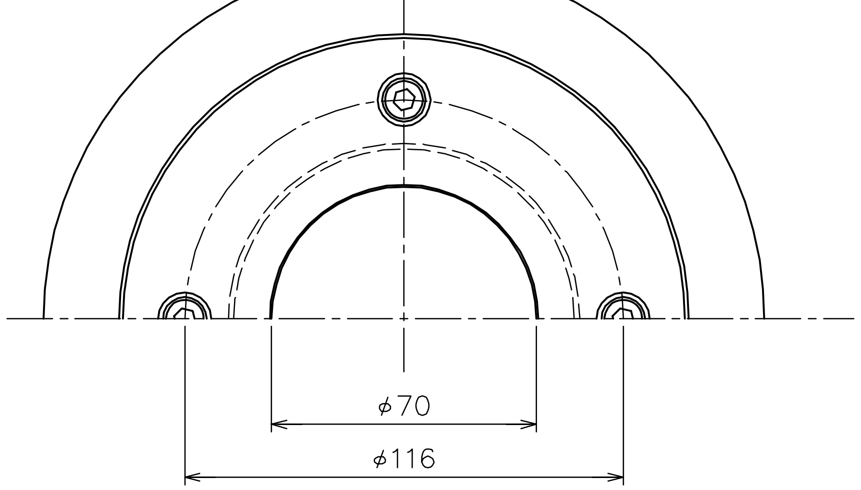
FURUNO

	D-14
周波数 FREQUENCY	50 KHz

表2 (Table2)

寸法区分 (mm) Dimensions	公差 (mm) Tolerance
L≦50	±1.5
50<L≦100	±2.5
100<L≦500	±3





注記：

1. タンク下面は船底板と面一とし、船底板より凹まないように装備してください。
2. 船底板とタンクを溶接する際は、②タンク本体溶接部分の表面処理を剝がし、歪み防止のため①送受波器／⑥ゴムパッキンを取り外し、③取付フランジを必ず取付けて施工してください。
3. ②タンク本体の材質はNK（日本海事協会）規格のKSTPG370です。その化学成分を表1に示します。
4. タンクにはエピコンジンクリッチプライマーＢ－２（中国塗料）を塗布しています。
5. 塗装する際は、送受波器面を塗装しないように注意してください。
6. ①送受波器取付け後、A部および②タンク本体と③取付フランジの隙間をシリコン等で埋めてください。
7. ④締付けグランドは、図中B寸法が7.5～7.0mmになるように締付けてください。
8. 寸法公差は表2の通りです。
9. 質量には①送受波器を含みません。

NOTE:

1. THE TRANSDUCER TANK SHOULD BE WELDED FLUSH WITH SHIP'S HULL PLATE, AND SHOULD NOT RECEDE FROM THE HULL PLATE.
2. SCRAPE OFF SURFACE PLATING OF WELDING PART OF CASING ② BEFORE WELDING. TO AVOID DISTORTION BY HEAT, PUT FIXING FLANGE ③ WITHOUT TRANSDUCER ① AND GASKET ⑥ ONTO CASING ② WHILE WELDING.
3. MATERIAL OF CASING② MEETS NK (NIPPON KAIJI KYOUKAI) STANDARD KSTPG370. TABLE 1 INDICATES CHEMICAL COMPOSITION OF KSPTG370.
4. THE TRANSDUCER TANK IS FINISHED BY EPICON ZINC RICH PRIMER B−2 (CHUGOKU MARINE PAINTS,LTD.).
5. DO NOT PAINT TRANSDUCER FACE.
6. FILL THE SPACE OF POSITION 'A' AND THE GAP BETWEEN CASING ② AND FIXING FLANGE ③ WITH SILICONE SEALANT AFTER MOUNTING THE TRANSDUCER①.
7. TIGHTEN GLAND NUT ④ SO THAT DIMENSION 'B' IS BETWEEN 7.0 mm AND 7.5 mm.
8. TABLE 2 INDICATES TOLERANCE OF DIMENSIONS.
9. MASS DOES NOT INCLUDE TRANSDUCER①.

表 1 (Table 1)

化学成分 Chemical Composition	C	Si	Mn	P	S	Cr	Mo
含有量(%) Content(%)	0.25以下 or less	0.35以下 or less	0.30~0.90	0.040以下 or less	0.040以下 or less	なし Nil	なし Nil

表3 (Table3)

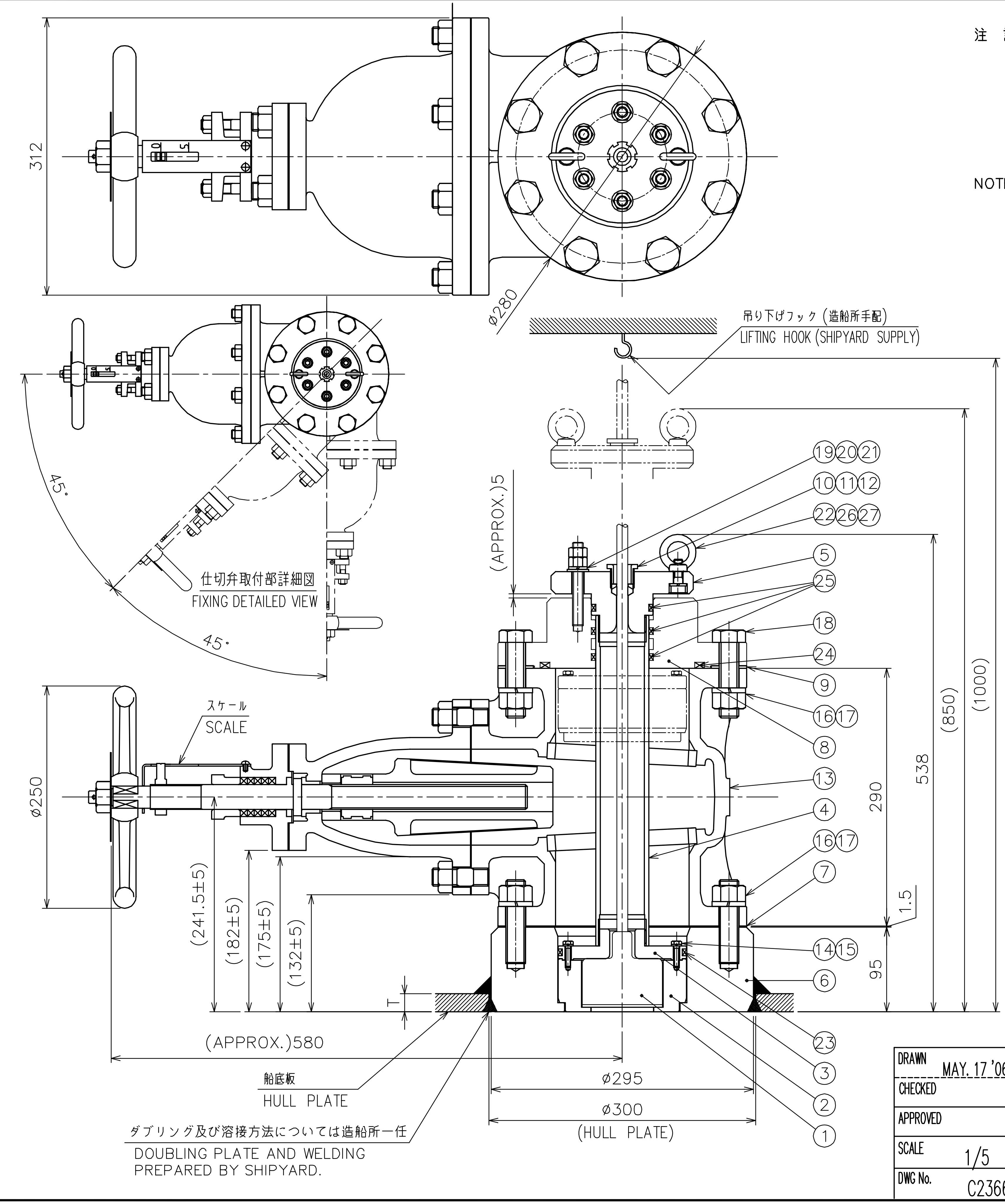
板厚寸法 (mm) Thickness		本体質量 (kg) MASS of TANK
標準品 Standard	T=20	18 ± 10%
指定品 Optional	T=12	15 ± 10%
	T=25	20 ± 10%

船底厚に応じて板厚Tを選択ください
CHOOSE THICKNESS "T" ACCORDING TO THICKNESS OF HULL PLATE.

品番 ITEM	品名 NAME	材質 MATERIAL	数量 Q'TY	図番 DWG.NO.	摘要 REMARKS
8	バネ座金 SPRING WASHER	SUS316L	4	M6	
7	六角穴付きボルト HEX.S.H.C.SCREW	SUS316L	4	M6×25	
6	ゴムパッキン GASKET	CR	1	TPB-11-08	
5	座金 WASHER	C3604B	1	TPB-11-07	
4	締付けグランド GLAND NUT	C3604B	1	JIS F8801 20 1a	
3	取付フランジ FIXING FLANGE	SUS316L	1	TTF−5600−02	
2	タンク本体 CASING EPOXY ZINC RICH PRIMER	KSTPG370	1	TTF−5600−01	船級認定材 CLASSIFICATION SOCIETY APPROVED MATERIAL
1	送受波器 TRANSDUCER		1	50B−6B	表3質量には含まず NOT INCLUDED IN MASS.

DRAWN Mar. 13, '06 E. MIYOSHI		TITLE TTF−5600 (5K−32A)
CHECKED TAKAHASHI. T		名称 送受波器(50kHz)タンク 送受波器装備図
APPROVED Y. Hatai		
SCALE 1/2	MASS 表3 TABLE 3 ±10% kg	NAME TRANSDUCER (50 kHz) TANK TRANSDUCER INSTALLATION
DWG No. C2001-362-X	02-TTF-565G-0	

FURUNO ELECTRIC CO., LTD.



注　記　1．ゲートバルブ⑬を取付ける際はナット⑯の回り止め対策として、ボルト⑱、寸切りボルト(⑥に付属)およびナット⑯を脱脂後、ロックタイト#271をして塗布して完全に締めてください。
2．ゲートバルブ部以外の部分は4.9×10^5Paの水圧試験がされています。
3．ゲートバルブ⑬は45°ピッチで任意の方向に取付け可能です。
4．指定外の寸法公差は表1の通りです。
5．質量には送受波器①を含みません。

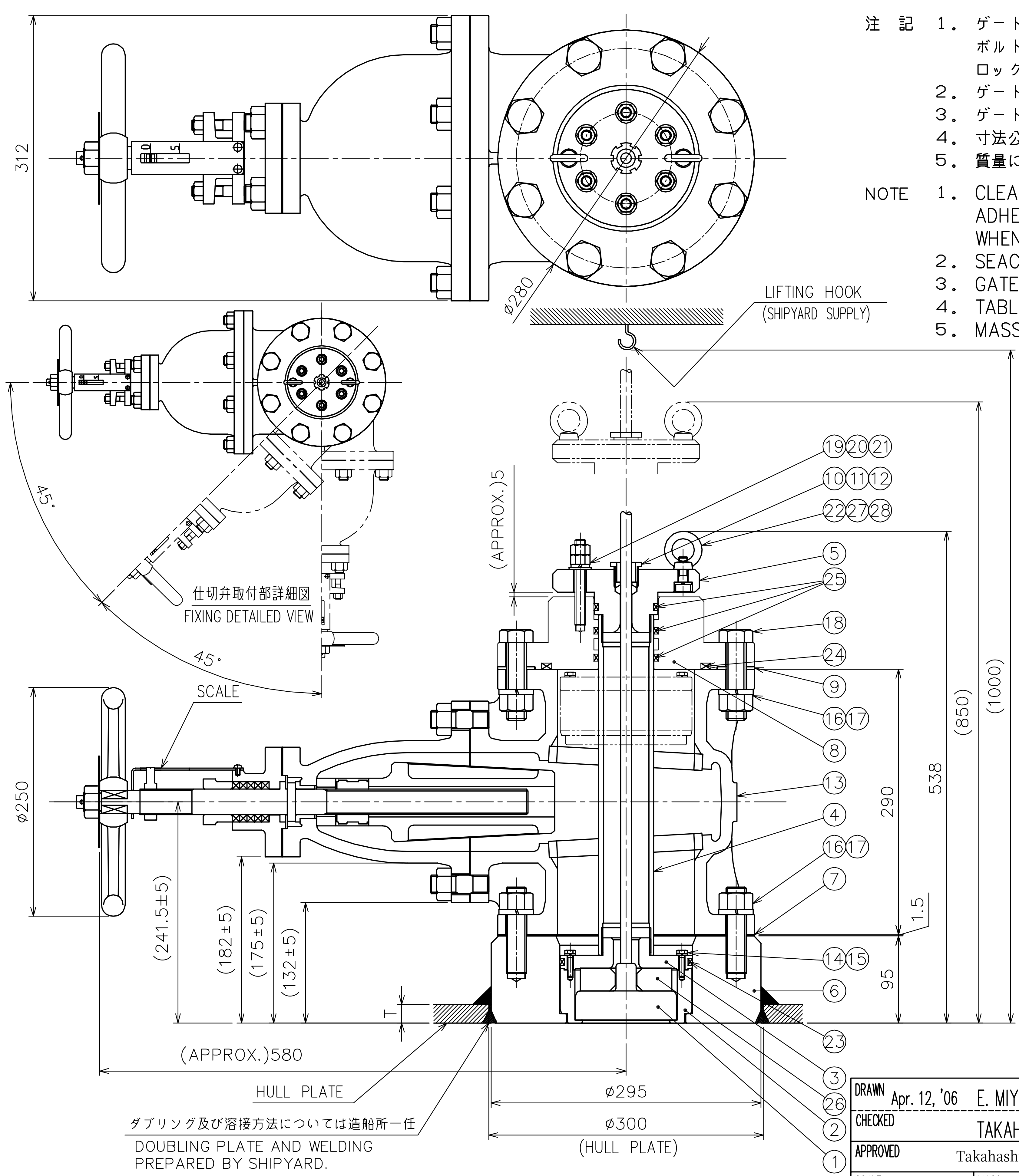
NOTE
1. CLEAN NUTS⑯AND BOLTS WITH SOLVENT, COAT THEIR THREADS WITH ADHESIVE/SEALANT (LOCTITE#271) AND THEN TIGHTEN THEM SECURELY WHEN MOUNTING GATE VALVE ⑬.
2. SEACHEST EXCEPT GATE VALVE IS TESTED UNDER 4.9×10^5 Pa WATER PRESSURE.
3. GATE VALVE⑬CAN BE ATTACHED IN THE ANY DIRECTION IN INCREMENT OF 45°.
4. TABLE 1 INDICATES TOLERANCE OF DIMENSIONS WHICH IS NOT SPECIFIED.
5. MASS DOES NOT INCLUDE TRANSDUCER①.

表 1(Table 1)

寸法区分(mm) DIMENSIONS	公差(mm) TOLERANCE
L≤50	±1.5
50<L≤100	±2.5
100<L≤500	±3
500<L≤1000	±4

品番 ITEM	品名 NAME	材質 MATERIAL	数量 Q'TY	図番 DWG.NO.	摘要 REMARKS
27	HEX.S.H.C.SCREW M10×30	SUS316L	2		
26	SPRING WASHER M10	SUS316L	2		
25	O-RING	NBR	3	JIS B2401 P60	
24	O-RING	NBR	1	JIS B2401 P170	
23	O-RING	NBR	1	JIS B2401 P135	
22	EYENUT M10	SUS304	2		
21	FLAT WASHER M12	SUS316L	4		
20	SPRING WASHER M12	SUS316L	4		
19	NUT M12	SUS316L	8		
18	BOLT M20×80	SUS316L	8		
17	SPRING WASHER M20	SUS316L	16		
16	NUT M20	SUS316L	16		
15	SPRING WASHER M6	SUS316L	6		
14	BOLT M6×25	SUS316L	6		
13	GATE VALVE 9.8×10^5Pa ZINC RICH PRIMER	SC480	1	02-129-6311	CLASSIFIATION SOCIETY APPROVED
12	WASHER	C3604B	1	TPB-11-07	
11	PACKING	CR	1	TPB-11-08	
10	GRAND	C3604B	1	JIS F8801 20 1a	
9	GASKET2	CR	1	02-129-6308	
8	SEACHEST CAP ZINC RICH PRIMER	KA	1	02-129-6307	CLASSIFIATION SOCIETY APPROVED MATERIAL
7	GASKET1	JOINT SHEET	1	02-129-6306	T/#1995 t=1.5mm
6	SPACER ZINC RICH PRIMER	KA	1	02-129-6305	CLASSIFIATION SOCIETY APPROVED MATERIAL
5	FLANGE2	SUS316L	1	02-129-6304	
4	SHAFT	SUS316LTP	1	02-129-6303	
3	FLANGE1	SUS316L	1	02-129-6302	
2	TRANSDUCER CASE	SUS316L	1	02-129-6301	
1	TRANSDUCER		1		50B-6B

DRAWN	MAY. 17 '06 E. MIYOSHI	TITLE	GV-50B-6B
CHECKED	TAKAHASHI. T	名称	ゲートバルブ
APPROVED	Y. Hatai	FE-700 (50K)	送受波器装備図
SCALE 1/5	MASS 170 ±10% kg	NAME	GATE VALVE
DWG No. C2366-T01- E	REF No. 02-129-630G-4		TRANSDUCER INSTALLATION



注 記

1. ゲートバルブ⑬を取付ける際はナット⑯の回り止め対策として、ボルト⑱、寸切りボルト(⑥に付属)およびナット⑯を脱脂後、ロックタイト#271をして塗布して完全に締めてください。
2. ゲートバルブ部以外の部分は4.9×10^{5}Paの水圧試験がされています。
3. ゲートバルブ⑬は45° ピッチで任意の方向に取付け可能です。
4. 寸法公差は表1の通りです。
5. 質量には送受波器①を含みません。

NOTE

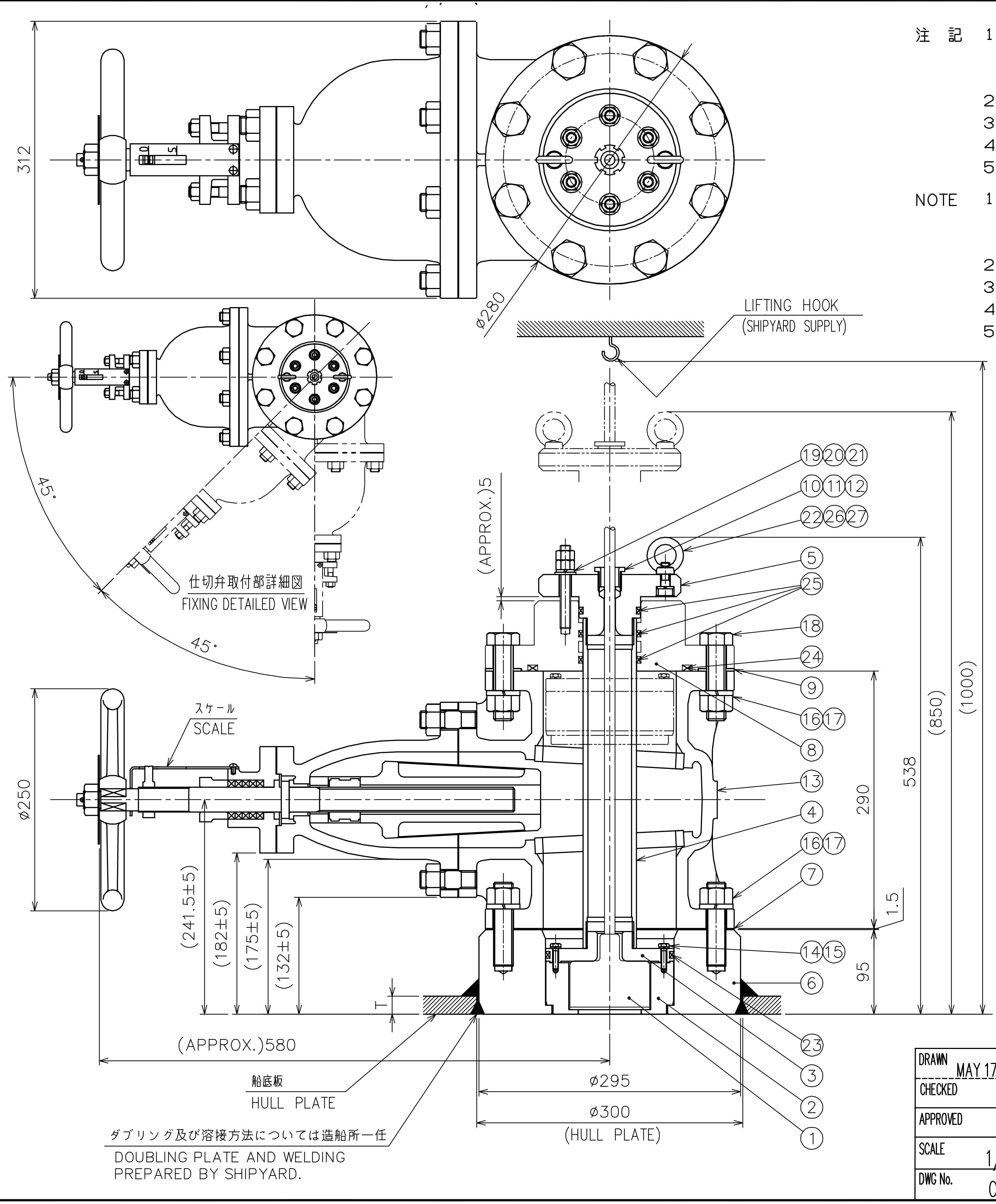
1. CLEAN NUTS⑯AND BOLTS WITH SOLVENT, COAT THEIR THREADS WITH ADHESIVE/SEALANT (LOCTITE#271) AND THEN TIGHTEN THEM SECURELY WHEN MOUNTING GATE VALVE⑬.
2. SEACHEST EXCEPT GATE VALVE IS TESTED UNDER 4.9×10^5 Pa WATER PRESSURE.
3. GATE VALVE⑬CAN BE ATTACHED IN THE ANY DIRECTION IN INCREMENT OF 45°.
4. TABLE 1 INDICATES TOLERANCE OF DIMENSIONS WHICH IS NOT SPECIFIED.
5. MASS DOES NOT INCLUDE TRANSDUCER①.

表 1(Table 1)

寸法区分(mm) DIMENSIONS	公差(mm) TOLERANCE
L≦50	±1.5
50<L≦100	±2.5
100<L≦500	±3
500<L≦1000	±4

品番 ITEM	品名 NAME	材質 MATERIAL	数量 Q'TY	図番 DWG.NO.	摘要 REMARKS
28	HEX.S.H.C.SCREW M10×30	SUS316L	2		
27	SPRING WASHER M10	SUS316L	2		
26	DAMPER	CR	1	TTF-2000-03	
25	O-RING	NBR	3	JIS B2401 P60	
24	O-RING	NBR	1	JIS B2401 P170	
23	O-RING	NBR	1	JIS B2401 P135	
22	EYENUT M10	SUS304	2		
21	FLAT WASHER M12	SUS316L	4		
20	SPRING WASHER M12	SUS316L	4		
19	NUT M12	SUS316L	8		
18	BOLT M20×80	SUS316L	8		
17	SPRING WASHER M20	SUS316L	16		
16	NUT M20	SUS316L	16		
15	SPRING WASHER M6	SUS316L	6		
14	BOLT M6×25	SUS316L	6		
13	GATE VALVE 9.8×10^{5}Pa ZINC RICH PRIMER	SC480	1	02-129-6311	CLASSIFIATION SOCIETY APPROVED
12	WASHER	C3604B	1	TPB-11-07	
11	PACKING	CR	1	TPB-11-08	
10	GRAND	C3604B	1	JIS F8801 20 1a	
9	GASKET2	CR	1	02-129-6308	
8	SEACHEST CAP ZINC RICH PRIMER	KA	1	02-129-6307	CLASSIFICATION SOCIETY APPROVED MATERIAL
7	GASKET1	JOINT SHEET	1	02-129-6306	T/#1995 t=1.5mm
6	SPACER ZINC RICH PRIMER	KA	1	02-129-6305	CLASSIFIATION SOCIETY APPROVED MATERIAL
5	FLANGE 2	SUS316L	1	02-129-6304	
4	SHAFT	SUS316LTP	1	02-129-6303	
3	FLANGE 1	SUS316L	1	02-129-6302	
2	TRANSDUCER CASE	SUS316L	1	02-129-7301	
1	TRANSDUCER		1		200B-8B

DRAWN	Apr. 12, '06 E. MIYOSHI	TITLE	GV-200B-8B
CHECKED	TAKAHASHI. T	名 称	ゲートバルブ 送受波器装備図
APPROVED	Takahashi.T	FE-700 (200K)	
SCALE 1/5	MASS 170 ±10% kg	NAME	GATE VALVE TRANSDUCER INSTALLATION
DWG.No.	C2366-T02- E	02-129-730G-4	



注 記 1．ゲートバルブ⑬を取付ける際はナット⑯の回り止め対策として、ボルト⑱、寸切りボルト(⑥に付属)およびナット⑯を脱脂後、ロックタイト#271をして塗布して完全に締めてください。
2．ゲートバルブ部以外の部分は4.9×10^5Paの水圧試験がされています。
3．ゲートバルブ⑬は45° ピッチで任意の方向に取付け可能です。
4．指定外の寸法公差は表1の通りです。
5．質量には送受波器①を含みません。

NOTE 1. CLEAN NUTS⑯ AND BOLTS WITH SOLVENT, COAT THEIR THREADS WITH ADHESIVE/SEALANT (LOCTITE#271) AND THEN TIGHTEN THEM SECURELY WHEN MOUNTING GATE VALVE⑬.
2. SEACHEST EXCEPT GATE VALVE IS TESTED UNDER 4.9×10^5 Pa WATER PRESSURE.
3. GATE VALVE⑬ CAN BE ATTACHED IN THE ANY DIRECTION IN INCREMENT OF 45°.
4. TABLE 1 INDICATES TOLERANCE OF DIMENSIONS WHICH IS NOT SPECIFIED.
5. MASS DOES NOT INCLUDE TRANSDUCER①.

表 1(Table 1)

寸法区分(mm) DIMENSIONS	公差(mm) TOLERANCE
L≦50	±1.5
50<L≦100	±2.5
100<L≦500	±3
500<L≦1000	±4

高張力鋼 仕様
FOR HIGH TENSILE STRENGTH STEEL

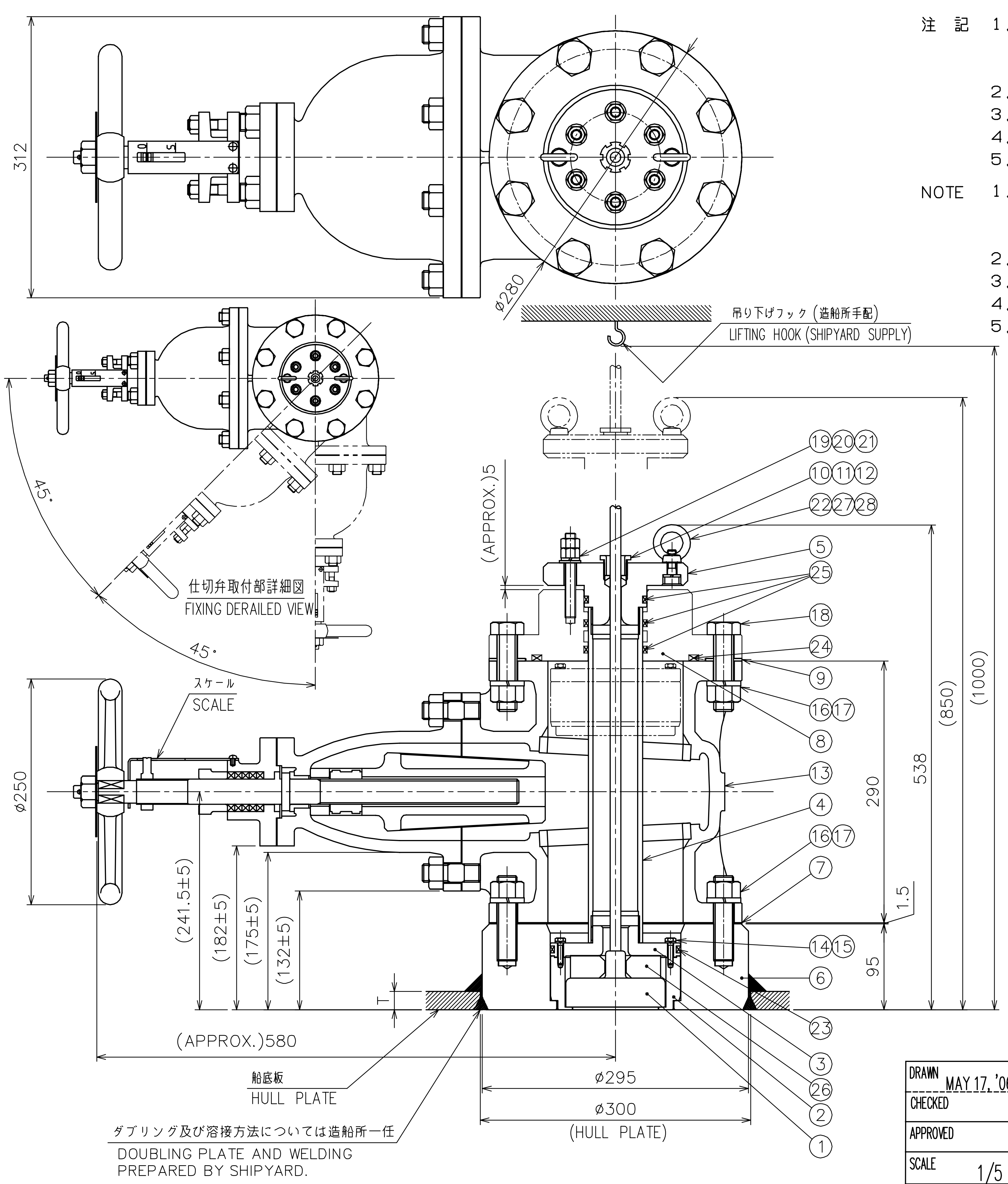
品番 ITEM	品 名 NAME	材 質 MATERIAL	数量 Q'TY	図 番 DWG.NO.	摘 要 REMARKS
27	HEX.S.H.C.SCREW M10×30	SUS316L	2		
26	SPRING WASHER M10	SUS316L	2		
25	O-RING	NBR	3	JIS B2401 P60	
24	O-RING	NBR	1	JIS B2401 P170	
23	O-RING	NBR	1	JIS B2401 P135	
22	EYENUT M10	SUS304	2		
21	FLAT WASHER M12	SUS316L	4		
20	SPRING WASHER M12	SUS316L	4		
19	NUT M12	SUS316L	8		
18	BOLT M20×80	SUS316L	8		
17	SPRING WASHER M20	SUS316L	16		
16	NUT M20	SUS316L	16		
15	SPRING WASHER M6	SUS316L	6		
14	BOLT M6×25	SUS316L	6		
13	GATE VALVE 9.8×10^5Pa ZINC RICH PRIMER	SC480	1	02-129-6311	CLASSIFIATION SOCIETY APPROVED
12	WASHER	C3604B	1	TPB-11-07	
11	PACKING	CR	1	TPB-11-08	
10	GRAND	C3604B	1	JIS F8801 20 1a	
9	GASKET2	CR	1	02-129-6308	
8	SEACHEST CAP KA32 ZINC RICH PRIMER	**KA32**	1	02-129-6322	CLASSIFIATION SOCIETY APPROVED MATERIAL
7	GASKET1	JOINT SHEET	1	02-129-6306	T/#1995 t=1.5mm
6	SPACER KA32 ZINC RICH PRIMER	**KA32**	1	02-129-6321	CLASSIFIATION SOCIETY APPROVED MATERIAL
5	FLANGE2	SUS316L	1	02-129-6304	
4	SHAFT	SUS316LTP	1	02-129-6303	
3	FLANGE1	SUS316L	1	02-129-6302	
2	TRANSDUCER CASE	SUS316L	1	02-129-6301	
1	TRANSDUCER		1		50B-6B

DRAWN MAY 17.'06 E. MIYOSHI		TITLE	GV-50B-6B
CHECKED TAKAHASHI. T		名 称	ゲートバルブ 送受波器装備図
APPROVED Y. Hatai	FE-700 (50K)		
SCALE 1/5	MASS 170 ±10% kg	NAME	GATE VALVE TRANSDUCER INSTALLATION
DWG No. C2366-T03- D	REF No. 02-129-631G-3		

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注　記　1。ゲートバルブ ⑬ を取付ける際はナット ⑯ の回り止め対策として、
ボルト ⑱ 、寸切りボルト(⑥ に付属)およびナット ⑯ を脱脂後、
ロックタイト#271をして塗布して完全に締めてください。
2。ゲートバルブ部以外の部分は4.9×10^5Paの水圧試験がされています。
3。ゲートバルブ ⑬ は45° ピッチで任意の方向に取付け可能です。
4。指定外の寸法公差は表1の通りです。
5。質量には送受波器 ① を含みません。

NOTE
1. CLEAN NUTS ⑯ AND BOLTS WITH SOLVENT, COAT THEIR THREADS WITH ADHESIVE/SEALANT (LOCTITE#271) AND THEN TIGHTEN THEM SECURELY WHEN MOUNTING GATE VALVE ⑬ .
2. SEACHEST EXCEPT GATE VALVE IS TESTED UNDER 4.9×10^5 Pa WATER PRESSURE.
3. GATE VALVE ⑬ CAN BE ATTACHED IN THE ANY DIRECTION IN INCREMENT OF 45°.
4. TABLE 1 INDICATES TOLERANCE OF DIMENSIONS WHICH IS NOT SPECIFIED.
5. MASS DOES NOT INCLUDE TRANSDUCER ①.



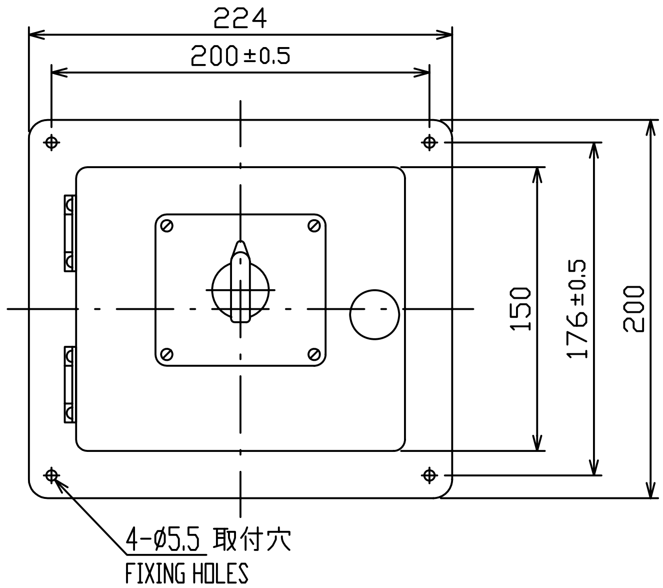
高張力鋼 仕様
FOR HIGH TENSILE STRENGTH STEEL

表 1(Table 1)

寸法区分(mm) DIMENSIONS	公差(mm) TOLERANCE
L≦50	±1.5
50<L≦100	±2.5
100<L≦500	±3
500<L≦1000	±4

品番 ITEM	品名 NAME	材質 MATERIAL	数量 Q'TY	図番 DWG.NO.	摘要 REMARKS
28	HEX.S.H.C.SCREW M10×30	SUS316L	2		
27	SPRING WASHER M10	SUS316L	2		
26	DAMPER	CR	1	TTF-2000-03	
25	O-RING	NBR	3	JIS B2401 P60	
24	O-RING	NBR	1	JIS B2401 P170	
23	O-RING	NBR	1	JIS B2401 P135	
22	EYENUT M10	SUS304	2		
21	FLAT WASHER M12	SUS316L	4		
20	SPRING WASHER M12	SUS316L	4		
19	NUT M12	SUS316L	8		
18	BOLT M20×80	SUS316L	8		
17	SPRING WASHER M20	SUS316L	16		
16	NUT M20	SUS316L	16		
15	SPRING WASHER M6	SUS316L	6		
14	BOLT M6×25	SUS316L	6		
13	GATE VALVE 9.8×10^5Pa ZINC RICH PRIMER	SC480	1	02-129-6311	CLASSIFIATION SOCIETY APPROVED
12	WASHER	C3604B	1	TPB-11-07	
11	PACKING	CR	1	TPB-11-08	
10	GRAND	C3604B	1	JIS F8801 20 1a	
9	GASKET2	CR	1	02-129-6308	
8	SEACHEST CAP KA32 ZINC RICH PRIMER	**KA32**	1	02-129-6322	CLASSIFIATION SOCIETY APPROVED MATERIAL
7	GASKET1	JOINT SHEET	1	02-129-6306	T/#1995 t=1.5mm
6	SPACER KA32 ZINC RICH PRIMER	**KA32**	1	02-129-6321	CLASSIFIATION SOCIETY APPROVED MATERIAL
5	FLANGE 2	SUS316L	1	02-129-6304	
4	SHAFT	SUS316LTP	1	02-129-6303	
3	FLANGE 1	SUS316L	1	02-129-6302	
2	TRANSDUCER CASE	SUS316L	1	02-129-7301	
1	TRANSDUCER		1		200B-8B

DRAWN MAY 17,'06 E. MIYOSHI		TITLE	GV-200B-8B
CHECKED TAKAHASHI. T		名称	ゲートバルブ
APPROVED Y. Hatai	FE-700 (200K)		送受波器装備図
SCALE 1/5	MASS 170 ±10% kg	NAME	GATE VALVE
DWG No. C2366-T04- D	DWG No. 02-129-731G-3		TRANSDUCER INSTALLATION



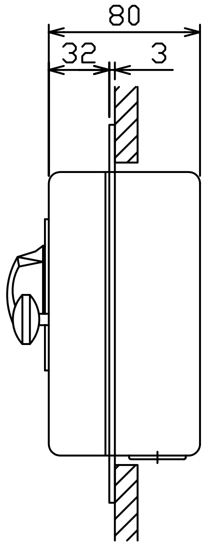
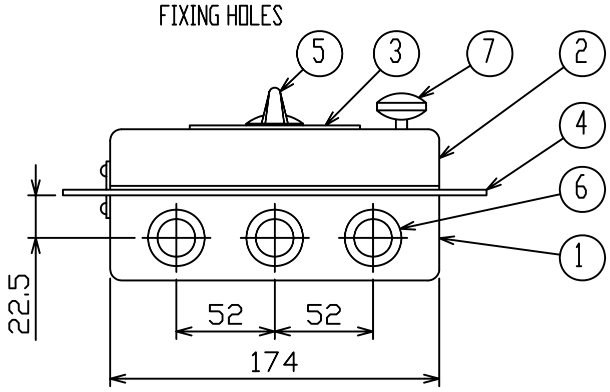
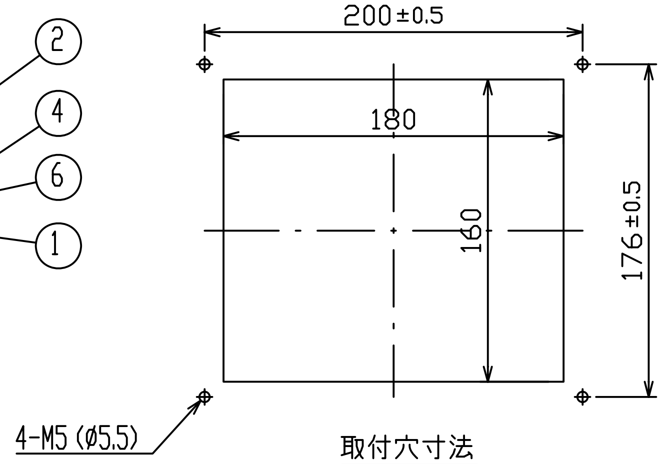


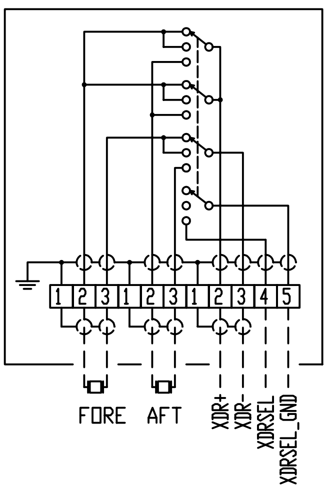
表1 TABLE 1

寸法区分(mm) DIMENSION	公差(mm) TOLERANCE
0 < L ≦ 50	±1.5
50 < L ≦ 100	±2.5
100 < L ≦ 500	±3





取付穴寸法
CUTOUT DIMENSIONS



注記 1）指定なき寸法公差は表1による。

NOTE 1. TABLE 1 INDICATES TOLERANCE OF DIMENSIONS WHICH IS NOT SPECIFIED.

品番 ITEM	品名 NAME	材質 MATERIAL	数量 Q'TY	図番 DWG. NO.	摘要 REMARKS
7	把手 KNOB	BsBM2	1		
6	ゴムブッシュ RUBBER BUSHING	CR	3		
5	切換スイッチ SWITCH	PM-EG	1		
4	フランジ FLANGE	SS34P	1		
3	銘板 NAMEPLATE	SSP34P	1		
2	ケース蓋 CABINET DOOR	SS34P	1		
1	本体 CABINET	SS34P	1		

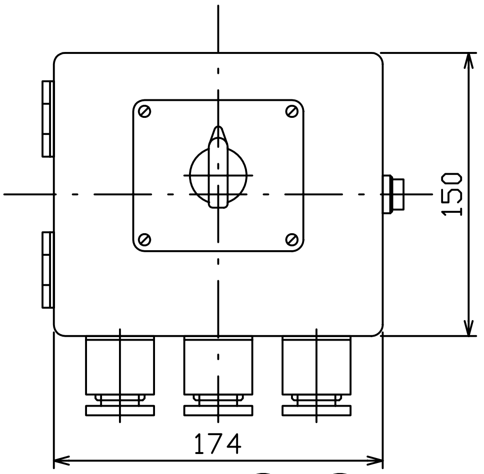
DRAWN	Apr. 21 '06	T.YAMASAKI
CHECKED	Apr. 21 '06	T.TAKENO
APPROVED	Apr.28'06	T.MAtsuguchi
SCALE 1/4	MASS 3 kg ±10%	
DWG.No.	C2009-001- F	

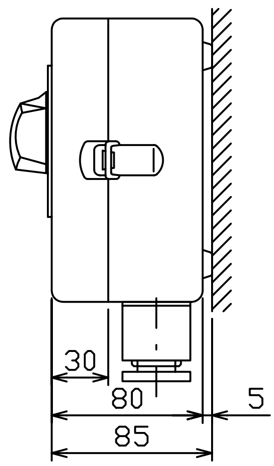
TITLE	EX-8
名称	送受波器切換器（埋込装備）
	外寸図
NAME	TRANSDUCER SWITCH BOX (FLUSH MOUNT)
	OUTLINE DRAWING

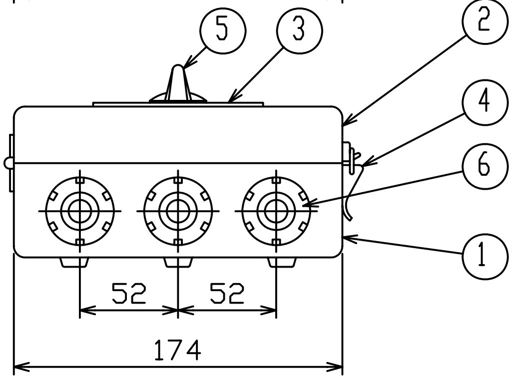
FURUNO ELECTRIC CO., LTD.

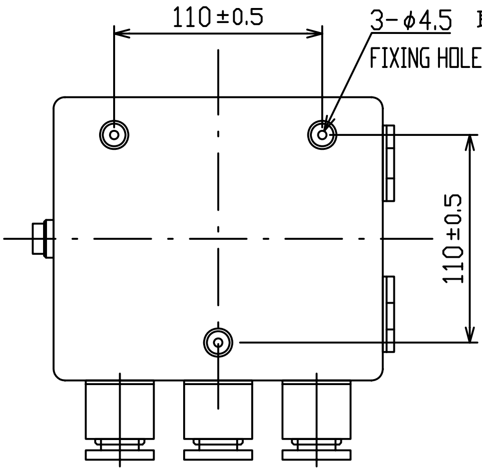
表1 TABLE 1

寸法区分(mm) DIMENSION	公差(mm) TOLERANCE
0 < L ≦ 50	±1.5
50 < L ≦ 100	±2.5
100 < L ≦ 500	±3

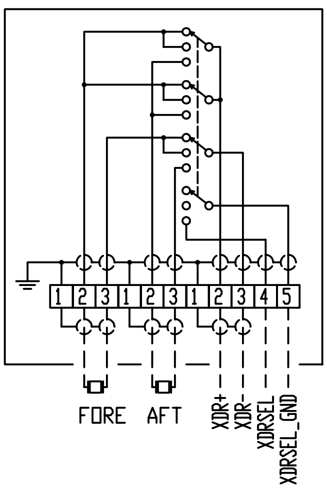








背面図
REAR VIEW



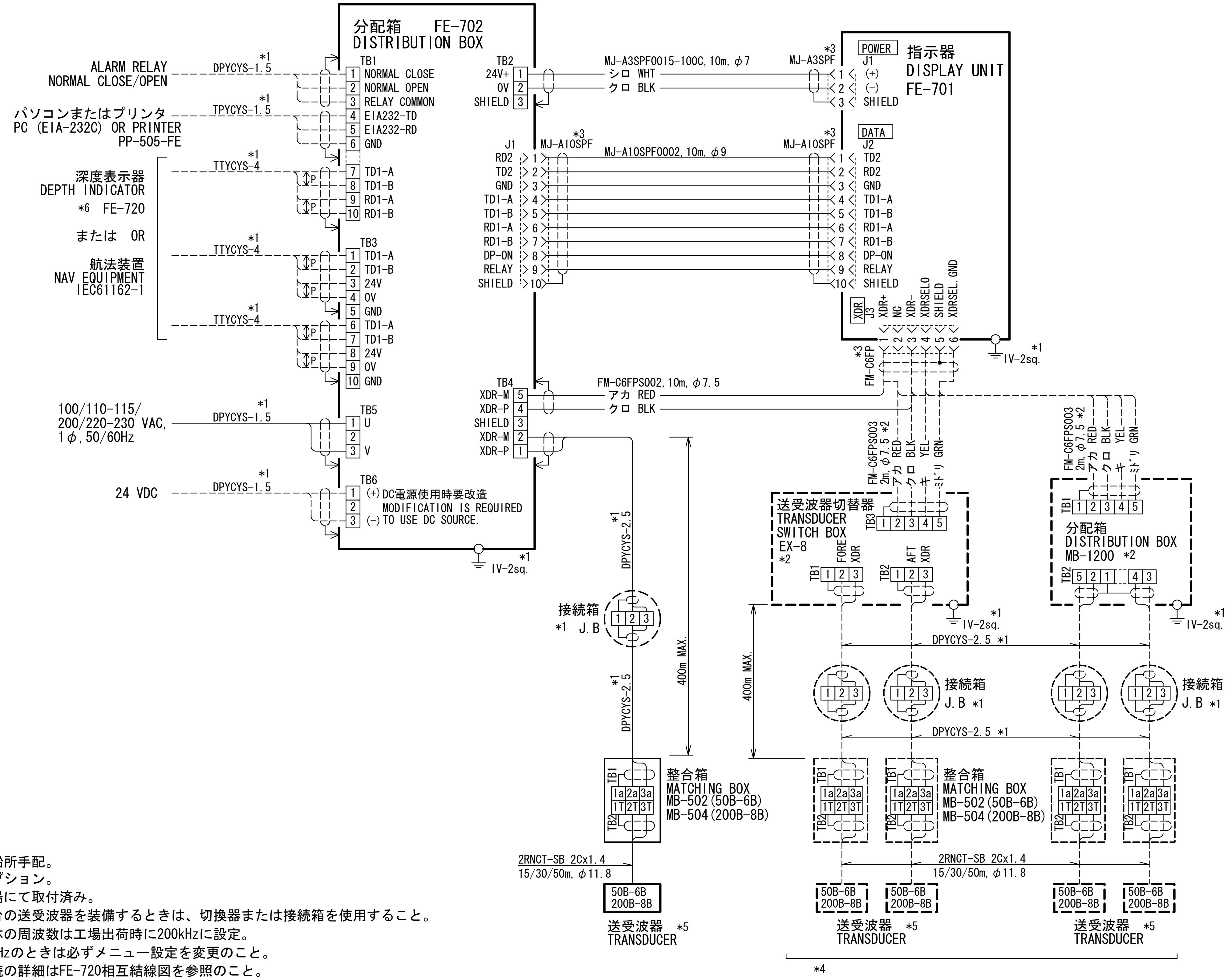
注記　1）指定なき寸法公差は表1による。

NOTE　1. TABLE 1 INDICATES TOLERANCE OF DIMENSIONS WHICH IS NOT SPECIFIED.

品番 ITEM	品名 NAME	材質 MATERIAL	数量 Q'TY	図番 DWG. NO.	摘要 REMARKS
6	電線貫通金物 CABLE GLAND		3	JIS F8801-A20b	
5	切換スイッチ SWITCH	PM-EG	1		
4	蝶番 HINGE		1		
3	銘板 NAMEPLATE	SSP34P	1		
2	ケース蓋 CABINET DOOR	SS34P	1		
1	本体 CABINET	SS34P	1		

DRAWN	Apr. 24 '06 T.YAMASAKI	TITLE	EX-8
CHECKED	Apr. 24 '06 T.TAKENO	名称	送受波器切換器（壁掛装備）
APPROVED	Apr.28'06 T.Matsuguchi		外寸図
SCALE	1/4 MASS 2.7 ±10% kg	NAME	TRANSDUCER SWITCH BOX (BULKHEAD MOUNT)
DWG.No.	C2009-002- F		OUTLINE DRAWING

FURUNO

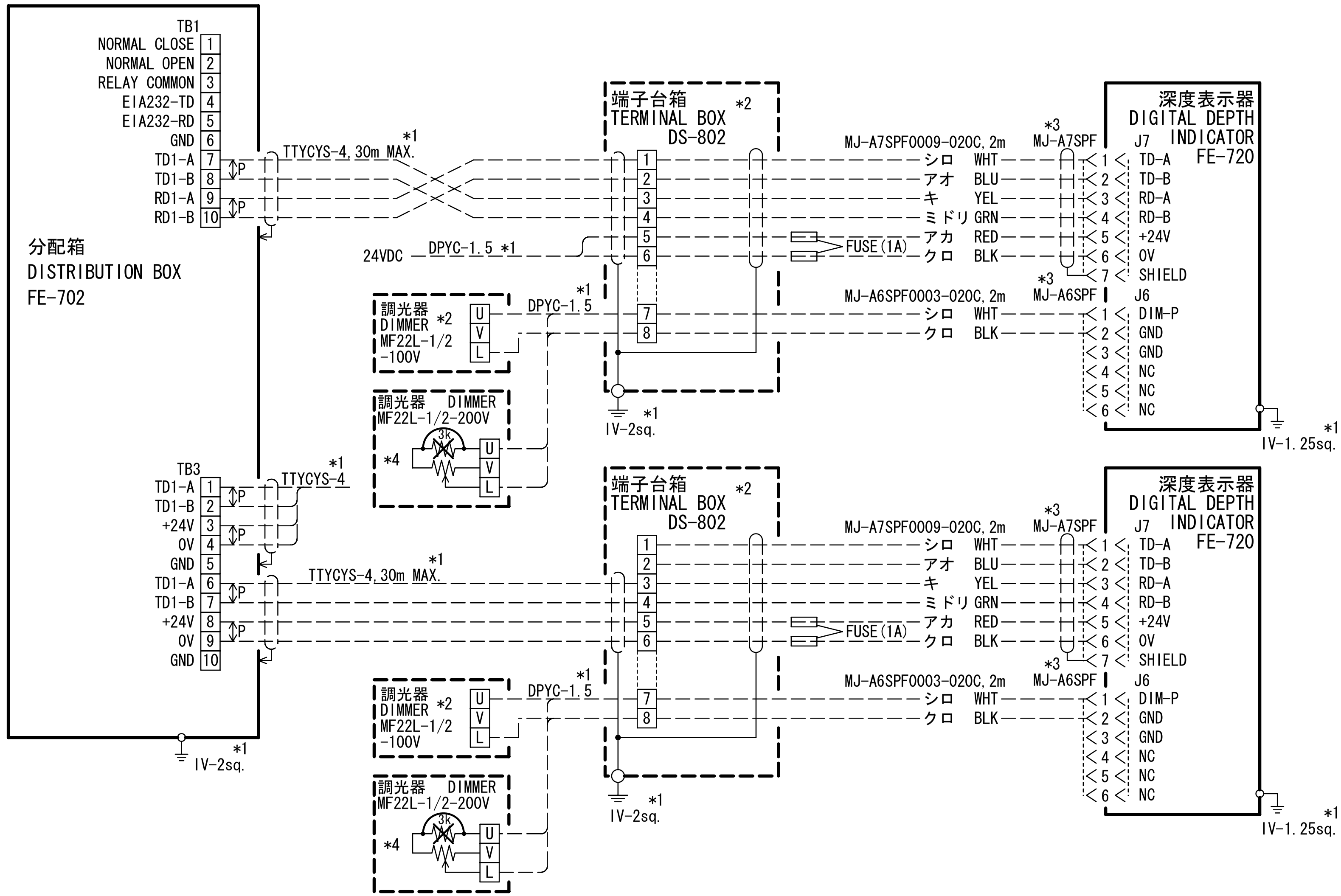


注記
＊１）造船所手配。
＊２）オプション。
＊３）工場にて取付済み。
＊４）２台の送受波器を装備するときは、切換器または接続箱を使用すること。
＊５）本体の周波数は工場出荷時に200kHzに設定。
　　　50kHzのときは必ずメニュー設定を変更のこと。
＊６）接続の詳細はFE-720相互結線図を参照のこと。

NOTE
*1. SHIPYARD SUPPLY.
*2. OPTION.
*3. FITTED AT FACTORY.
*4. USE A DISTRIBUTION BOX OR A MATCHING BOX WHEN TWO TRANSDUCERS ARE INSTALLED.
*5. TRANSMIT FREQUENCY IS SET TO 200 kHz AT FACTORY.
CHANGE THE SETTING FROM MENU FOR 50 kHz USE.
*6. REFER TO FE-720 INTERCONNECTION DIAGRAM FOR DETAIL.

DRAWN 11/Mar/09 T.YAMASAKI		TITLE	FE-700
CHECKED 12/Mar/09 T.TAKENO		名称	音響測深機
APPROVED 25/Mar/09 R.Esumi			相互結線図
SCALE	MASS kg	NAME	NAVIGATIONAL ECHO SOUNDER
DWG.No. C2366-C01- N			INTERCONNECTION DIAGRAM

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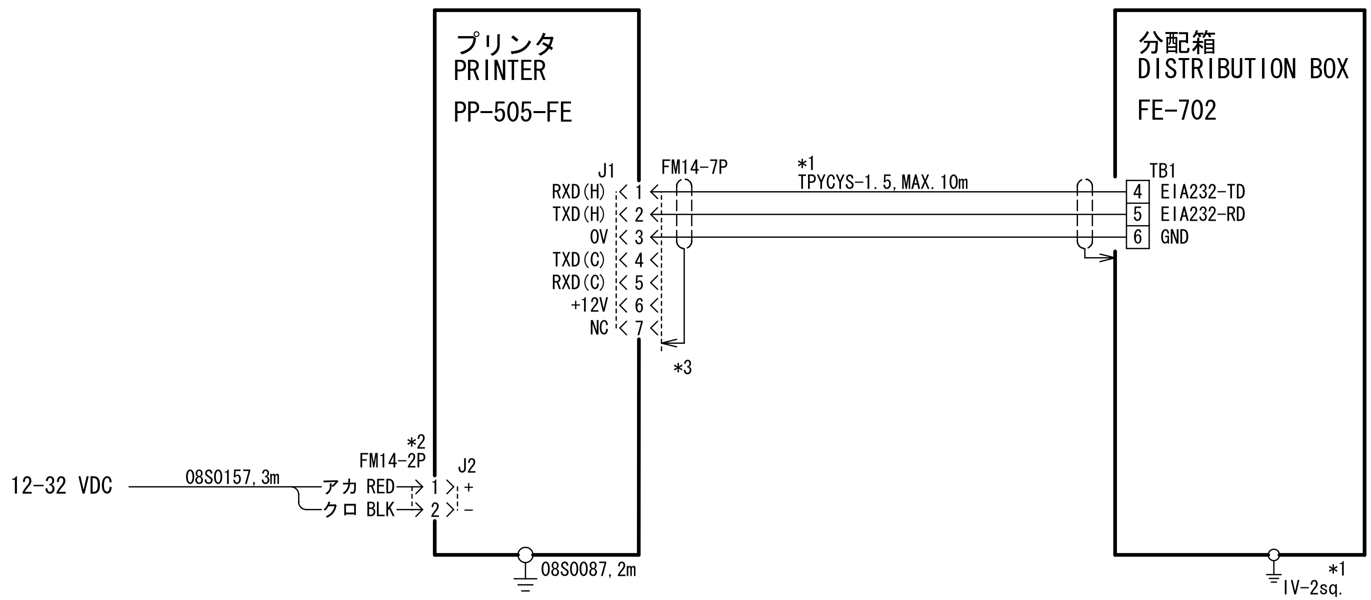


注記
＊１）造船所手配。
＊２）オプション。
＊３）工場にて取付済み。
＊４）200V仕様では、固定抵抗3kΩを削除する。

NOTE
*1. SHIPYARD SUPPLY.
*2. OPTION.
*3. FITTED AT FACTORY.
*4. REMOVE RESISTANCE 3kΩ FOR USING 200V SET.

DRAWN Apr. 10 '07 T. YAMASAKI		TITLE FE-720
CHECKED Apr. 10 '07 T. TAKENO		名称 深度表示器
APPROVED Apr.17'07 R.Esumi	FE-700	相互結線図
SCALE	MASS kg	NAME DIGITAL DEPTH INDICATOR
DWG. No. C2366-C02- K	REF. No. 02-129-1004- 0	INTERCONNECTION DIAGRAM

FURUNO ELECTRIC CO., LTD.



注記
＊１）造船所手配。
＊２）工場にて取付済み。
＊３）コネクタケースでアースをとる。

NOTE
*1: SHIPYARD SUPPLY.
*2: FITTED AT FACTORY.
*3: GROUND THRU CONNECTOR CLAMP.

DRAWN Dec. 28 '06 T. YAMASAKI		TITLE	PP-505-FE
CHECKED Jan. 5 '07 T. TAKENO		名 称	プリンタ
APPROVED Jan. 5'07 R.Esumi	FE-700		相互結線図
SCALE	MASS	NAME	PRINTER
DWG. No. C2366-C03- E	REF. No. 16-006-3022-0		INTERCONNECTION DIAGRAM

FURUNO ELECTRIC CO., LTD.